

STUDIES IN BIGNONIACEAE 19: GENERIC MERGERS AND NEW SPECIES OF SOUTH AMERICAN BIGNONIACEAE¹

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ABSTRACT

Preparation of the treatment of Bignoniaceae for *Flora de Venezuela* and field work in Venezuela, Colombia, Ecuador, and Brazil have turned up several novelties and some taxonomic problems. In this paper the *Adenocalymma apurense*, *A. bracteolatum*, and *Amphilophium paniculatum* complexes in Venezuela are reinterpreted necessitating one new variety, one new combination, and resurrection of two previously synonymized species. *Anemopaegma villosum*, *Arrabidaea prancei*, *Cuspidaria subincana*, *Haplolophium rodriguesii*, *Mansoa onohualcoides*, *Memora aspericarpa*, *M. tanaeciicarpa*, *Tanaecium apiculatum*, *Tynnanthus villosus*, *Anemopaegma alatum*, and *A. patelliforme* are described as new. Seven generic mergers necessitating a total of nine new combinations are proposed: *Onohualcoa* to *Mansoa*, *Pseudopaegma* to *Anemopaegma*, *Sanhilaria* to *Paragonia*, *Nestoria* and *Kuhlmannia* to *Pleonotoma*, *Roseodendron* to *Tabebuia*, and *Xerotecoma* to *Godmania*. An eighth generic merger—*Distictella* with *Distictis*—is rejected, but a new combination is needed for one species which is transferred to *Distictis*.

***Adenocalymma apurense* (H.B.K.) Sandw. and relatives.**

As previously interpreted (Gentry, 1974a), *A. apurense* (including *A. inundatum* and *A. calderonii*) is a polymorphic widespread species ranging from Mexico to Para, Brazil. Additional collections of this complex indicate that it is even more polymorphic than previously supposed. The *A. apurense* complex consists of at least three distinct entities which deserve formal taxonomic recognition. Each of these three entities, virtually indistinguishable on the basis of vegetative and floral characteristics, has a distinctive fruit.

A form with winged seeds and non-splitting capsule valves occurs from Mexico to northern Colombia and Venezuela and has been variously known as *A. inundatum* Mart. ex DC., *A. hintonii* Sandw. and *A. calderonii* (Standl.) Seib. The other two forms have wingless seeds and are restricted to South America. One, with non-splitting capsule valves and more coriaceous leaflets, has been known as *A. inundatum* var. *surinamense*. This form occurs from the upper Orinoco through the Guianas to Para, Brazil. I follow Sandwith in regarding it as not specifically distinct from the northern form with winged seeds. The third entity has wingless seeds and a shorter almost globose capsule with each valve splitting in half at maturity, i.e., effectively 4-valved. Although these three entities would not warrant any kind of taxonomic recognition on the basis of floral or vegetative characteristics, the 4-valved form can also be distinguished from the other two forms by its shorter (1–2 mm long) more square-ended ovary and is probably specifically distinct.

The oldest name for any member of this complex is *A. apurense*, based on *Bignonia apurense* H. B. K. from the middle Orinoco region of Venezuela. I have previously (Gentry, 1974a) identified the type of *A. apurense*, which lacks fruit,

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with the wing-seeded form of this complex, mainly because of its small subcoriaceous leaflets. However, only specimens with wingless seeds have been subsequently collected along the Orinoco so the *A. apurense* type should presumably be identified instead with one of the two wingless-seeded forms. The leaflets of the type collection are puberulous beneath, as are those of several collections of the form with subglobose capsules and splitting valves. Although this character is not constant [e.g., *Gentry et al. 10694* (MO) has a 4-valved capsule and leaflets completely glabrous beneath], neither of the other two forms ever has leaflets puberulous below. Typical *A. apurense* is thus the small-capsuled, 4-valved form whose fruit has yet to be described. This capsule is subglobose-ellipsoid, rounded apically and basally, not at all compressed, 4-sulcate, splitting into 4 parts at maturity with each valve splitting down the midline, 2.4–6 cm long, each half-valve 1.3–2.5 cm wide, slightly lepidote when young, becoming densely papillate, drying tannish; seeds thick, wingless, 1.2–2 cm in diameter.

In my opinion the difference between the fruit described above for *A. apurense* and that of the other two forms is adequate for specific segregation. The oldest available name for either (presumably) 2-valved form is *A. inundatum*. As long as winged versus wingless seeds are not considered adequate to justify specific segregation (see Gentry, 1973; Sandwith, 1955; Hunt, 1972), both the wing-seeded and wingless-seeded entities may be included in *A. inundatum*. The type of *A. inundatum* may represent the wingless-seeded form since no wing-seeded collections of this complex from Guiana or Amazonia have been seen. *Adenocalymma inundatum* var. *surinamense*, as defined by its wingless seeds, would thus be synonymous with typical *A. inundatum*, and a new infraspecific name for the northern entity with winged seeds would be necessary. Nevertheless, it seems advisable to retain the extant usage—*A. inundatum* var. *surinamense* with wingless seeds, *A. inundatum* var. *inundatum* with winged seeds—until fruiting material from Amazonian Brazil is available.

***Adenocalymma purpurascens* Rusby, Descr. S. Amer. Pl. 121. 1920.**

This species ranges from Bolivia to Venezuela and was treated by Sandwith (in the herbarium) as a synonym of *A. bracteatatum* DC. The fruit of neither *A. purpurascens* nor *A. bracteatatum* has been described. A recent collection [*Gentry et al. 10672* (MO, VEN, duplicates to be distributed) from Bolívar, Venezuela] of flowering and fruiting material of *Adenocalymma purpurascens* taken from the same plant solves a longstanding puzzle and adds additional evidence of the inability of presence or absence of fruit wings to serve as an absolute generic criterion (cf. Gentry, 1973, 1974b, 1974c).

The fruit of this species proves to be an oblong uncompressed capsule with the valves woody and prominently thick-winged along each margin. The fruit is thus tetragonal with raised angles in cross section. It is 10–19 cm long, 2.5–3.5 cm wide (including wings), 3–5 cm thick (including wings), drying light brown, the midrib not visible, glabrous, the surface slightly wrinkled-striate, the wrinkles making an acute angle with the axis of fruit. The seeds are bialate, 1.1–1.8 cm long, 3.3–6 cm wide, the wings more or less hyaline-membranaceous and indistinctly demarcated from the rather thick brown seed body.

This striking fruit is unique in *Adenocalymma* because of its conspicuous *Cuspidaria*-like wings. This prompted the late Dr. Sandwith to tentatively determine a fruiting collection (*Seibert 2012* from Madre de Dios, Peru) as *Cuspidaria* sp. nov. despite the collector's field notes that the plant was the same species as his number 2011, the latter an obvious *Adenocalymma* in flower. The identity of this interesting collection had otherwise remained an unsolved mystery.

Actually, Seibert's flowering collection is not *A. purpurascens* but *A. impressum* (Rusby) Sandw. It is no wonder that the collector confused the two species: *A. purpurascens* and *A. impressum* are twins vegetatively. The main vegetative difference between the two species is a quantitative one—the pale-drying veins and veinlets of *A. purpurascens* dry a lighter color than those of *A. impressum*. In flower the smaller (6–9 by 5–7 mm) calyx with an irregularly toothed margin of *A. purpurascens* is quite distinct from the larger (11–14 by 7–12 mm) campanulate calyx with a truncate margin (remotely and minutely 5-denticulate) of *A. impressum*. The bracts and bracteoles of the latter species also tend to be slightly larger. In fruit these two plants are utterly distinctive, the subterete linear-oblong capsule of *A. impressum* showing no resemblance to the winged capsule of *A. bracteolatum*.

Discovery of the winged fruit of *A. purpurascens* also creates a problem. The type of *A. bracteolatum* (*d'Orbigny 758, P*) from Mato Grosso lacks the 4-ridged tetragonal ovary otherwise associated with the wing-fruited species. Perhaps *A. purpurascens* is not the same as *A. bracteolatum* after all? This suspicion is confirmed by two Mato Grosso collections at BM identified as *A. croceum* S. Moore. The flowering type of *A. croceum* proves to be the second collection of *A. bracteolatum* (Gentry, 1976), likewise lacking a tetragonal ovary. The second collection of *A. croceum* is in fruit, comes from the same area as both of the flowering collections, and agrees vegetatively with them. It is clearly *A. bracteolatum*. The fruit of *A. bracteolatum* is oblong and subterete with completely unwinged woody valves. *Adenocalymma purpurascens* with its strikingly winged fruits must be distinct from *A. bracteolatum*. The only apparent characters, besides the ovary, for separating flowering *A. bracteolatum* from *A. purpurascens* are the tenuous ones of dark brown-drying (rather than black) inflorescence branches and a very slightly larger calyx. I cannot distinguish sterile material of these two species. The small leaves cited by Bureau & Schumann (1896–1897) as characteristic of *A. bracteolatum* are present only in the inflorescence; even some sheets of the type collection include the larger leaves characteristic of both it and *A. purpurascens*.

***Amphilophium paniculatum* (L.) H.B.K. in Venezuela.**

Three forms of this variable species, each characterized by its fruit, occur in Venezuela. The flowers of the three are indistinguishable. One of these forms occurs in the Sierra de Imataca region of Delta Amacuro and adjacent Bolívar State. These plants have very large (10–12 cm long, 4–5 cm wide, 1–3 cm thick), relatively flat capsules with muricate-rugose surfaces having the conspicuous projections widely scattered. Vegetatively these plants are distinguished by the yellowish, very finely and densely dendroid tomentose lower leaf surface. The

second form has a smooth granular-textured fruit surface, without prominent ridges or projections. This form has the leaves densely lepidote but otherwise glabrous beneath, except for tufts of long flexuous, mostly simple trichomes in the nerve axils and minute subappressed simple trichomes along the main nerves. It occurs along the dry inner base of the Cordillera de la Costa with fruiting collections from Anzoategui, Miranda, Guárico, and Portuguesa States. This is the fruit type which occurs throughout the range of the species outside Venezuela. The third fruit form is similar to the preceding in size and convex valves, but the valves are sharply and closely reticulate-wrinkled, the wrinkles almost muricate. The leaflets associated with these fruits vary from quite densely dendroid pubescent beneath, especially along the main veins (*Gentry et al. 11172*), to densely lepidote but otherwise essentially glabrous (*Agostini 110*). Most trichomes of these plants are dendroid and stiff; tufts of lax simple trichomes in the nerve axils beneath are uniformly absent. These collections come from Portuguesa, Barinas, and Lara States and the Distrito Federal; I have also seen a collection [*Davidse 5219* (COL, MO)] from Vichada Territory in the Colombian Llanos. A fourth form of *A. paniculatum*, characterized by large leaflets having a denser, uniformly dendroid, rather coarse indumentum, is also found in Venezuela; this has been called *A. macrophyllum* H.B.K. Its fruits are unknown.

Outside Venezuela only the smooth surfaced fruit is known, and it is found associated with plants running the whole gamut from lepidote to densely dendroid pubescent leaves. I have previously followed Seibert (1940a) in treating the conspicuously pubescent-leaved forms (including *A. macrophyllum*) as *A. paniculatum* var. *molle* and the less pubescent forms as *A. paniculatum* var. *paniculatum*.

In the absence of fruits, Pittier described two new species of *Amphilophium* from Venezuela based on differences in pubescence. *A. xerophilum* vegetatively matches the smooth-fruited Venezuelan collections and must be considered part of typical *A. paniculatum*. *A. mollicomum* is almost certainly a pubescent extreme (cf. *Gentry et al. 11172, 11179*) of the form with closely reticulate-ridged fruits which probably merits some kind of taxonomic recognition. I propose to treat it as a variety of *A. paniculatum*, ***A. paniculatum* var. *mollicomum*** (Pittier) A. Gentry, comb. et stat. nov. (based on *A. mollicomum* Pittier, J. Wash. Acad. Sci. 18: 120. 1928.). Although var. *paniculatum* in Venezuela (and adjacent Colombia) can usually be vegetatively separated from var. *mollicomum* by the uniform leaf indumentum described above, the latter's great variation in leaf indumentum is exceeded by extra-Venezuelan smooth-fruited material, and determination of flowering collections is doubtful. In general, collections from the Cordillera de la Costa region are *mollicomum*, while collections outside this area are not. However, the occurrence of *mollicomum*-like pubescent forms outside this area (including the fruiting Colombian collection of bona fide *mollicomum*) and occasional collections with tufted simple trichomes (*Pittier 11566*) inside it indicates some range overlap and/or breakdown of the vegetative characters. The fruits of *macrophyllum* are unknown and its possible identification with var. *mollicomum* remains moot. Only fruiting collections or specimens associated both geographically and by pubescence type with fruiting collections are assigned to

var. *mollicomum* in the *Flora de Venezuela*. The uniformly densely pubescent-leaved forms usually referred to *A. macrophyllum* H.B.K. are still assumed to be *A. paniculatum* var. *molle* in the absence of fruiting material which could prove them to be var. *mollicomum* instead.

***Amphilophium paniculatum* var. *imatacense* A. Gentry, var. nov.**

Distinguitur indumento foliolorum subtili, dense, trichomatibus dendroideis; fructu magno, complanato, dissite muricato-rugoso.

TYPE: VENEZUELA. BOLÍVAR-DELTA AMACURO BORDER: 61°44'W 8°4'N, primary forest near Río Grande o Toro, E of Upata, 300 m, liana, stem dull gray-brownish-green, tendrils gray-brownish-green, leaves papery, slightly glossy dark green above, dull, rough and paler green beneath, immature fruits dull pale green, 15 × 4.5 cm, 8 Apr. 1967, *de Bruijn 1662* (MO, holotype; isotypes WAG (3)).

In contrast to *A. paniculatum* and *A. paniculatum* var. *mollicomum*, the Sierra Imataca plant is vegetatively distinct and homogeneous. It clearly warrants taxonomic recognition. No collections of *A. paniculatum* from this area are known and it may well prove more than a variety. However, the variability inherent throughout this complex makes it prudent to accord it only varietal recognition at present.

Additional collections examined: VENEZUELA. BOLÍVAR: El Palmar hacia Río Grande, Sierra de Imataca, 300 m, bejuco grande, hojas bifolioladas, discoloras, calices verdes, sepalos abiertos, simulando un calículo, corolla en botón amarilla con apice morado, cuando abierta (bilabiada) purpurea, luego blanca, frutos verrucosos, hasta 15 cm largos, pedasos, especie frecuente, 21 Feb. 1959, *Bernardi 7192* (VEN, F). Tumeremo to Anacoco, N side of Cuyuni River, 19 km from Guyana frontier, 140–200 m, 18 Mar. 1974, *Gentry et al. 10711* (MO, VEN). Sierra Imataca, rainforest between junction with Río Reforma and 1 km below junction along river, between Río la Reforma and Puerto Rico, N of El Palmar, 200–250 m, vine, leaves subcoriaceous, dull green above, gray green below, calyx spreading, gray green, corolla creamy white, *Steyermark 88117* (VEN). DELTA AMACURO: Near the border (Río Grande o Toro) with Estado Bolívar, ca. 61°44'W 8°4'N, low primary forest, liana 20 m high, 5 cm in diameter, leaves papery dull, medium green above, paler beneath, fruits pale green, dull, *Breteler 3833* (VEN, WAG). Bosque pluvial Este de Río Grande, 37 km ENE de El Palmar, high-climbing liana, leaves tawny below, dull green above, corolla deep yellow, 10 Feb. 1964, *Steyermark 93128* (VEN).

***Arrabidaea prancei* A. Gentry, sp. nov.—FIG. 1A.**

Frutex scandens; ramuli subteretes, consociebus glandularum in nodis inter petioles; folia bifoliolata, interdum cirrhis simplicibus, foliolis ellipticis, acuminatis; inflorescentia floribus in paniculis parvis axillaribus dispositis; calyx cupulatus, truncatus, minute 5-denticulatus, lepidotus; corolla alba lavandula suffusa, campanulata supra basem longam tubularem; stamina subexserta, thecis divaricatis; ovarium anguste oblongum, lepidotum; capsula linearis, aliquantum lepidota; semina bialata, brunneola.

Liana; branchlets terete, striate, minutely lepidote or glabrous, when older drying reddish brown with numerous small, slightly raised almost circular lenticels, with 4 phloem arms in cross section; nodes with interpetiolar glandular fields; pseudostipules not evident. Leaves 2-foliolate, often with a simple tendril; leaflets elliptic, acuminate, truncate to broadly cuneate at base, subcoriaceous, 5–15 cm long, 4.2–9 cm wide, minutely lepidote, otherwise glabrous, more or less



FIGURE 1. A. *Arrabidaea prancei* A. Gentry; photo of type, Gentry 12882; $\times \frac{7}{16}$.—B. *Cuspidaria subincana* A. Gentry; photo of type, Gentry 12825; $\times \frac{1}{2}$.

conspicuously 3-veined from base, with 3–4 secondary veins on each side; petioles 0.6–4.5 cm long; petiole 1–4 cm long, lepidote. Inflorescence a few-branched panicle, flattened and wider at and below each joint, lepidote throughout, puberulous only at the joints and on margins of the minute (less than 1 mm long) bracts and bracteoles, the buds elongate, conical, tapering to an almost acuminate point. Flowers with calyx cupular, 7–10 mm long, 3–4 mm wide, more or less truncate, minutely and evenly 5-denticulate, occasionally slightly split on one side, densely lepidote, puberulous on margin and very sparsely in upper half, with often inconspicuous plate-shaped glands in upper half; corolla white or greenish white with the tube tinted purple outside, tubular-infundibuliform above a very long tubular base, 4.5–6 cm long, the tube 3.5–4.5 cm long, 0.8–1.0 cm wide at top, the basal portion 2.0–2.6 cm long, 1.5–2 mm wide, the lobes 1–1.5 cm long, densely puberulous outside and on lobes inside, the upper part of tube glabrous inside, sparsely puberulous at and below level of stamen insertion, becoming densely glandular pubescent between 9 and 15 mm above base of tube and abruptly glabrous below this area; stamens didynamous, subexserted, the anther thecae divaricate, glabrous, each 3 mm long, the longer filaments 1.6–1.8 cm long, the shorter filaments 1.2–1.5 cm long, the staminode 4–5 mm long, insertion 2.2–2.6 cm above base of corolla tube; pistil 4–4.5 cm long, the ovary linear oblong, tetragonal, the 4 angles raised (almost cross-shaped in cross section), 4 mm long, 1 mm wide, very densely lepidote, the ovules rather large, 2-seriate in each locule; disc 0.5 mm long, 1.25 mm wide. Capsule linear, compressed, blunt at apex and base, 25–36 cm long, 1.6–1.9 cm wide, the midline barely or not at all evident, the margins rounded, somewhat lepidote, drying brownish; seeds thin, bialate, the wings completely brown or with a thin hyaline marginal fringe, indistinctly demarcated from body of seed, 1.3–1.6 cm long, 2.6–4.8 cm wide.

TYPE: BRAZIL. AMAZONAS: Km 67 E of Manaus on Manaus-Itacoatiara Road, liana, flowers white, tube faintly lavender above without and sometimes below or within, fragrant, fruits green, 24 Nov. 1974, Gentry 12882 (INPA, holotype; isotypes MO and to be distributed).

Additional collections examined: BRAZIL. AMAZONAS: Basin of Rio Negro, road from Camanaus to Uaupes airport, roadside, vine, corolla white, exterior of tube purple, 30 Oct. 1971, *Prance et al.* 15863 (MO, NY). Rio Purus, Rio Ituxi, Lago Preto, 2 km N of Labrea, forest on terra firme, liana 10 cm diam. at widest point, calyx green-brown, corolla lavender-white outside but darker adaxially white inside, 26 June 1971, *Prance et al.* 13757 (MO, NY). Manaus, estrada Manaus-Itacoatiara, km 55, T. firme, argiloso, trepadeira, frutos maduros, 14 Oct. 1960, *Rodriguez & Coelho* 1839 (INPA). Estrada Castanho Tupana, entre o km 50-40; flores de color branca, tube violaceo, frutos verdes, 18 July 1972, *Silva et al.* 847 (INPA, MO). ACRE: Cruzeiro do Sul, Rio Jurua & Rio Moa, Estrada Alemanha, disturbed secondary forest by road, corolla greenish white tinted purple on exterior, 14 Apr. 1971, *Prance et al.* 11834 (NY). PARA: Rio Jari, Monte Dourado, flor lila clara, *Oliveira* 4479 (IAN). Rio Jari, Monte Dourado to Munguba, 13 May 1969, *Silva* 1955 (IAN). Rio Jari, Planalto A, flor branco aroxeadado, 23 Apr. 1969, *Silva* 1955 (IAN). Rio Jari, Estrada de Munguba, km 4, 19 Apr. 1969, *Silva* 1876 (IAN). Rio Jari, Estrada entre Monte Dourado e Planalto A, km 3, 22 May 1969, *Silva* 2030 (IAN).

The affinity of this distinctive new species with *Arrabidaea* is not immediately obvious because of its elongate white corolla. In such features as its racemose-paniculate inflorescence, subexserted anthers, and elongate tubular white flowers it is reminiscent of *Leucocalanthe*. Nevertheless, it shares most of the important characters of *Arrabidaea*, including interpetiolar glandular fields, simple tendrils, stems with 4 phloem arms in cross section, corolla pubescent without, straight divaricate anther thecae, and a conspicuous nectariferous disc. In fact, were one to predict the characteristics to be expected in a species of *Arrabidaea* adapted for hawkmoth pollination, one would come close to a description of *A. prancei*. Its closest relative seems to be *A. triplinervia* which has very similar trinerved leaflets, reduced, almost racemose inflorescences, a similar corolla shape (except for the long narrow basal constriction), and sometimes white flowers.

***Cuspidaria subincana* A. Gentry, sp. nov.—FIG. 1B.**

Frutex scandens; ramuli subteretes, consociibus glandularum in nodis inter petioles; folia trifoliata vel bifoliata, interdum cirrhis simplicibus, foliolis ellipticis, obtusis vel breviter cuspidatis, subtus canescentibus; inflorescentia floribus in panícula dispositis; calyx cupulatus, truncatus, minute 5-denticulatus, puberulus; corolla rubra, tubulo-infundibuliformis; antherarum lobi semicirculares, connectivo crasso; ovarium ovoideum, minute lepidotum; capsula linearis, subteres, puberula, bisulcata, seminibus bialatis.

Liana; branchlets terete, minutely striate, puberulous; interpetiolar glandular fields present; pseudostipules not noticeable; conspicuously lenticellate when older. Leaves 3-foliolate or 2-foliolate with a tendril or tendril scar; leaflets elliptic or obovate-elliptic to subrotund, the apex rounded or abruptly cuspidate, the base rounded to broadly cuneate, 3.5–14 cm long, 2.2–9 cm wide, chartaceous to subcoriaceous, the main veins slightly raised beneath, densely canescent below except the darker-drying veins, glabrous above except on midvein, drying dark brown above, whitish below with the less pubescent main veins contrastingly darker; petiolules 1–3 cm long; petioles 2–5 cm long, puberulous. Inflorescence an axillary or terminal panicle, its branches puberulous. Flowers with the calyx cupular, 5-denticulate, 4–5 mm long, 2–3 mm wide, conspicuously puberulous, eglandular or with a few glands near margin, the marginal teeth often extending as raised lines on upper third of calyx; corolla magenta with a white throat, tubular-infundibuliform, 2.7–4 cm long, 0.7–1.3 cm wide at mouth of tube, the tube 2.3–

3.4 cm long, the lobes 0.5–0.8 cm long, puberulous outside and on lobes and at level of stamen insertion inside; stamens didynamous, the anther thecae bent and reflexed sharply forward near middle, 1–2 mm long, glabrous, the connective extremely thick, extended; pistil 1.7–2.4 cm long, the ovary ovoid, 1.5–1.8 mm long, 1–1.2 mm wide, with two longitudinal furrows on each side, densely minutely lepidote, sometimes also scattered puberulous, the ovules 4-seriate in each locule; disc cupular-pulvinate, 1 mm long, 1.5 mm wide. Capsule linear, terete, 29 cm long, 1.3 cm wide, puberulous, drying grayish, with scattered small lenticel-like glands, each valve with a conspicuous median longitudinal furrow 2–3 mm wide and bordered by a slightly raised line on either side; seeds thin, flattened, bialate, 8–9 mm long, 3.7–4.6 cm wide, the hyaline membranaceous wings sharply demarcated from the seed body.

TYPE: BRAZIL. AMAZONAS: 2–5 km N of Manaus-Itacoatiara Road at km 79 near Rio Preto da Eva, 100–200 m, liana, flowers magenta with white throat, 24 Nov. 1974, *Gentry 12825* (INPA, holotype; isotypes MO, MG, RB, to be distributed).

Additional collections examined: VENEZUELA. BOLÍVAR: Bosques a lo largo de la frontera Venezolano-Brasilera, NE de la Serrania Pia-soi (Pia-shauhy, pia-Savi), 3°53', 62°46', 650–800 m, high-climbing vine, leaves subcoriaceous, deep green above, gray-green below, calyx brownish, corolla deep rose, style pink-maroon at tip, whitish below, rachis of inflorescence tawny-green, 5–6 Jan. 1962, *Steyermark 90694* (VEN). BRAZIL. AMAZONAS: 2–5 km N of Manaus-Itacoatiara Road at km 79 near Rio Preto da Eva, 100–200 m, *Gentry 12850* (INPA, MO). Manaus-Caracarai Road (BR 174), ca. km 100, roadside, vine, flowers magenta with white throat, 30 Nov. 1974, *Gentry & Ramos 12924* (INPA, MO). Estrado do Aleixo near Manaus, km 6–7 past INPA, second growth and forest edge, vine, fruits gray green, 2 Dec. 1974, *Gentry 13042* (INPA, MO). Munic. Humayta, near Livramento, Rio Livramento, 12 Oct.–6 Nov. 1934, *Krukoff 6878* (K, MO, NY). Munic. Manaus, road to Aleixo, 12 Aug.–1 Sep. 1936, *Krukoff 8012* (K, MO, NY). Km 55–60 da Rodov. Manaus-Itacoatiara, cipo, sobre chao, flores lilas, 24 Oct. 1963, *Oliveira 2770* (IAN, MO). Vic. of Labrea airport, Rio Purus, Rio Ituxi, fruit green, glaucous, 29 June 1971, *Prance et al. 13974* (MO, INPA, NY). Mata da terra firme, solo argiloso, entre o rio Castanho e o Araca, trepadeira com flores violaceae, 12 July 1972, *Silva et al. 549* (INPA, MO). 7 km N of Manaus on Estrada do Aleixo, vine, flowers light magenta, 21 Nov. 1974, *Gentry & Prance 12787* (INPA, MO). Ca. km 80, Manaus-Caracarai Road (BR 174), road cut, vine, flowers magenta, 30 Nov. 1974, *Gentry & Ramos 12927* (INPA, MO). Ca. km 70, Manaus-Caracarai Road (BR 174), road cut, vine, flowers magenta with white throat, reddish lines above each row of anthers, 1 Dec. 1974, *Gentry 13006* (INPA, MO). Estrada do Aleixo, Manaus, 15 Oct. 1947, *Guedes 24* (IAN).

Haplolophium rodriguesii A. Gentry, sp. nov.—FIG. 2.

Frutex scandens; ramuli sexanguli sine consociibus glandularum in nodis inter petioles; folia bifoliolata, interdum cirrhis fissis, foliolis ellipticis, coriaceis, subtus puberulis; inflorescentia floribus in racemis axillaribus dispositis; calyx cupulatus, margine crispato, stellatopiloso; corolla rubra, tubulo-campanulata, ad medium flexa; stamina didynama, thecis divaricatis; ovarium ovoideum, dense tomentosum; discus patelliformis; capsula ignota.

Liana; branchlets 6-sided, the angles ribbed, drying blackish, puberulous; interpetiolar glandular fields absent; pseudostipules not noticeable. Leaves 2-foliolate with a trifid tendril; leaflets elliptic, abruptly short-acuminate, the base rounded, 15–17 cm long, 9–12 cm wide, coriaceous, the veins and veinlets plane above, raised and intricately and conspicuously reticulate below, immersed-lepidote above, otherwise glabrous, simple-puberulous below, drying olive gray;

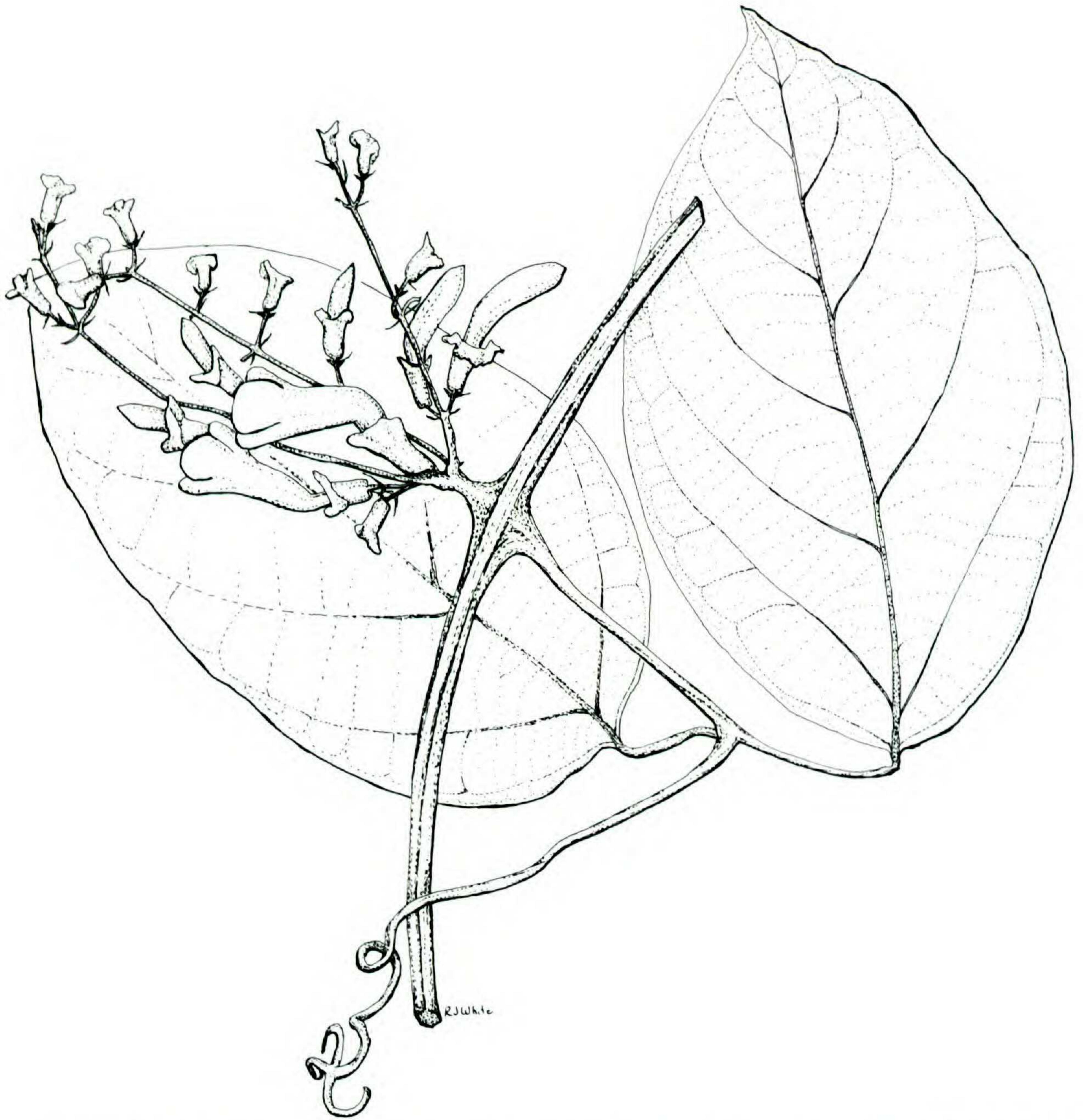


FIGURE 2. *Haplolophium rodriguesii* A. Gentry; $\times \frac{1}{2}$. [After Rodrigues 12951 (INPA).]

petiolules 2–4 cm long; petiole 6.5–7.5 cm long, puberulous. Inflorescence a fascicle of axillary racemes, puberulous with stellate trichomes, the flowers borne in pairs along rachis separated by 2–4 cm, each pair of pedicels subtended by two linear bracts 5–7 mm long and 1 mm wide, the pedicels 0.5–1 cm long, with a pair of linear 2–5 mm long bracteoles near middle. Flowers with the calyx having a cupular base and an expanded frilly margin, the base 6–8 mm long and 4–6 mm wide, the frilly margin ca. 5 mm wide, stellate-tomentose, with paired sub-linear glandular fields at top of base below the margin; corolla red, aromatic, relatively thick, tubular-campanulate, bent at 90° angle above base, 4–5 cm long, 0.8–1.2 cm wide, the tube ca. 1 cm to the bend, 2–2.5 cm above the bend, the lobes ca. 1 cm long, the throat with two longitudinal ridges, densely pubescent outside, pubescent inside on lobes and at level of stamen insertion, otherwise lepidote inside; stamens didynamous, inserted 7–8 mm from base of corolla tube,

the anther thecae divaricate, 3–4 mm long, the pollen grains 8-colpate; pistil 3.3–3.5 cm long, the stigma elliptic, acuminate, 3–4 mm by 1.5 mm, the style stellate tomentose, the ovary ovoid, 2 mm long, 2 mm wide, densely tomentose, the ovules ca. 8-seriate in each locule; disc patelliform, 1–1.5 mm long, 4–5 mm wide. Capsule unknown.

TYPE: BRAZIL. AMAZONAS: Manaus, estrada do Igarape do Passarinho, terreno firme argiloso, mata, trepadeira com gavinhas, flores roxas, aromaticas, 22 May 1962, *Rodrigues & Chagas 4460* (INPA, holotype; MO, NY, isotypes).

This remarkable plant, only the second known species of *Haplolophium*, is very distinct from *H. bracteatum* Cham. in its much larger leaves with intricately reticulate and densely puberulous lower surfaces, in its much more open inflorescence, and especially in its very inconspicuous linear inflorescence bracts and bracteoles. Nevertheless, it shares the fundamental characters of the genus including 6-angled branchlets, trifid non-disc-tipped tendrils, 8-colpate pollen, and, most notably, a calyx with a cupular truncate base and a frilly expanded margin. *Haplolophium* is intermediate between *Pithecoctenium* and *Amphilophium*, agreeing with the former in its tubular bent corollas, simple calyx, and echinate fruit and with the latter in its pollen, trifid tendrils, dendroid trichomes, and the presence of a frilly calyx margin. The intricately reticulate and raised venation beneath of *H. rodriguesii* is strikingly like that of *Distictella monophylla* Sandw.

Memora aspericarpa A. Gentry, sp. nov.—FIG. 3.

Arbor parva vel frutex; ramuli subteretes, sine consociebus glandularum in nodis interpetioles; pseudostipulae crassae foliaceae; folia saepe 15-foliolata pinnis principalibus tribus, foliolis lanceolatis vel anguste ellipticis, acuminatis, basi cuneatis vel rotundatis, glabris; inflorescentiae racemosae terminales, bracteis mature deciduis, probabiliter minutis, bracteolis minutis; calyx coriaceus, campanulatus, bilabiatus, extus plerumque glaber intus lepidotus; corolla flava, tubulo-infundibuliformis, extus glabra; stamina thecis divaricatis; pistillum ovario glabre; discus pulvinatus; fructus oblongus, teres, exasperatus, seminibus exalatis, maxime crassis.

Small tree or shrub, rarely subscandent, to 3 m tall; branchlets subterete, glabrous, lenticellate; nodes without interpetiolar glandular fields; pseudostipules thick-foliaceous, obovate, rounded. Leaves 2–3-compound, usually 15-foliolate with three 5-foliolate primary pinnae, each leaflet of lowermost leaflet pair of the terminal pinna sometimes replaced by a 3-foliolate secondary division, the leaf thus to 19-foliolate; tendrils not seen; leaflets lanceolate to narrowly elliptic, less commonly elliptic or narrowly ovate, acuminate, cuneate to rounded at base, subcoriaceous, 4–17 cm long, 1.2–8 cm wide, completely glabrous or with a few inconspicuous simple trichomes along midvein above; petiolules and petiole very sparsely puberulous or glabrate. Inflorescence a contracted terminal raceme, drying dark, the pedicels 0.8–1.5 cm long, inconspicuously short-puberulous, the bracts early deciduous, probably minute, the bracteoles minute, subulate, 1–4 mm long, ca. 1 mm wide, attached at or below middle of pedicel 5–10 mm below calyx, lepidote inside, finely pubescent at tip and along margin. Flowers with the calyx coriaceous, campanulate, bilabiate split $\frac{1}{3}$ – $\frac{1}{2}$ its length, 10–12 mm long, 8–10 mm wide, somewhat lepidote, with a few trichomes at apices of lobes,

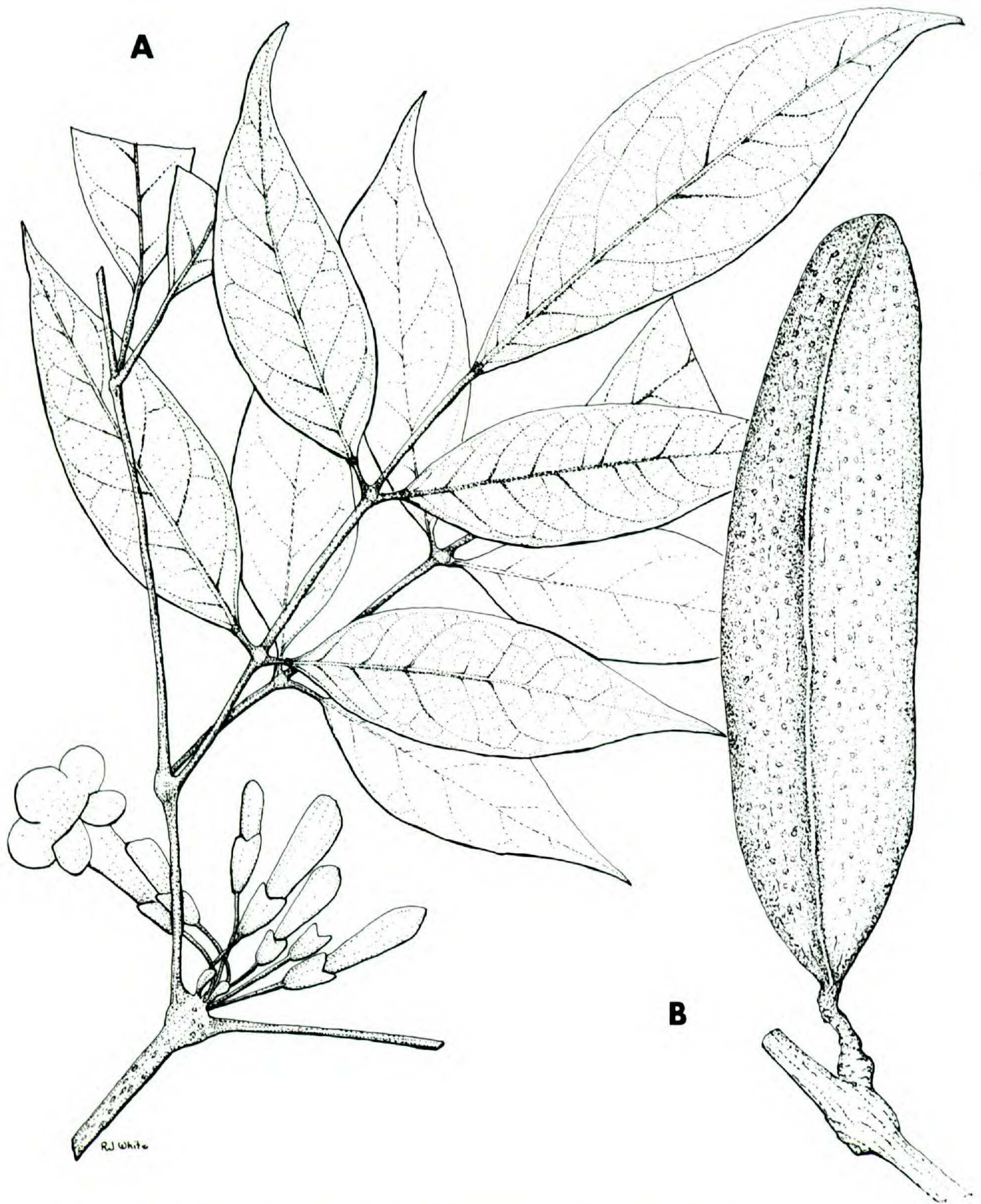


FIGURE 3. *Memora aspericarpa* A. Gentry.—A. Habit; $\times \frac{1}{2}$. [After Steyermark 105375 (VEN).]—B. Fruit; $\times \frac{1}{2}$. [After Aristeguieta & Pannier 1842 (VEN).]

otherwise glabrous outside, glandular lepidote inside, eglandular outside; corolla yellow, tubular-infundibuliform, 5.5–7.5 cm long, 1.2–2.4 cm wide at mouth of tube, the tube 4–5.8 cm long, lobes 1–1.5 cm long, mostly glabrous, the lobes sometimes with a few marginal trichomes, villous at and below level of stamen insertion; stamens didynamous, the anther thecae divaricate, 3–4 mm long, the longer filaments 3.7–3.8 cm long, the shorter filaments 2.7–2.8 cm long, the stami-

node 10–11 mm long, insertion 16–18 mm from base of corolla tube; pistil 4.8–5 cm long, the ovary linear-oblong, 3 mm long, 1 mm wide, glabrous; disc patelliform, 1–1.5 mm long, 2.5–3 mm wide. Capsule oblong, terete, 8–22 cm long, 3.3–4.7 cm in diameter, the apex obtuse or acutish, the base more or less rounded, macroscopically conspicuously rough-surfaced with many minute rather flat tubercles somewhat resembling coarse sandpaper in appearance, these tubercles coalescing and not individually distinct under a lens; seeds very thick, wingless, angulate, 2.3–2.5 cm long, 2.0–3 cm wide, the hilum broad, convex, 7–12 mm wide, 17–21 mm long.

TYPE: VENEZUELA. YARACUY: Selva nublada sobre piedras calcareas, entre el pueblo de Aroa y Altamira, 1050 m, small tree 3 m tall with slender trunk 1 cm diam., divergently branched above, corolla yellow, 22 Jan. 1972, *Steyermark 105375* (MO, holotype; VEN, isotype).

Additional collections examined: VENEZUELA. DISTRITO FEDERAL: Caruao, (fruit), *Pittier s.n.* (VEN). YARACUY: Montana que queda enfrente del caserio de Quebrada Seca, trepadora de olor a ajos, 2 July 1953, (fruit), *Aristeguieta & Pannier 1842* (VEN). TACHIRA: A la orilla de potreros, cerca a Jordan, bosque humedo tropical, arbolito, approx. 3 m alto, 26 Apr. 1964 (fruit), *Yjiaz 351* (MY). LARA: Terepaima, 1300–1600 m, arbusto trepador de flores amarillas (flowers, fruits), 24 Mar. 1959, *Trujillo 4116* (MY).

This species is restricted to upper elevations (mostly over 1,000 m) along the Venezuelan coastal cordillera east to the Distrito Federal.

Memora aspericarpa differs from *M. schomburgkii* (DC.) Miers in its smaller bilabiate (rather than spathaceous) calyx and thick-valved rough-surfaced fruit. It is perhaps most closely related to *M. cladotricha* Sandw. even though that species belongs to a different section of the arbitrarily subdivided genus. It resembles *M. cladotricha* in habit and fruit although lacking foliaceous inflorescence bracts and bracteoles. The fruit of *M. cladotricha*, though similar to that of *M. aspericarpa*, has a macroscopically smoother surface with a less dull texture. The papillae covering the fruit of *M. aspericarpa* tend to coalesce and are individually obscure when seen through a lens; the papillae of *M. cladotricha* are individually distinct microscopically.

Memora tanaeciicarpa A. Gentry, sp. nov.

Frutex scandens; ramuli teretes, glabrati, sine consociebus glandularum in nodis inter petioles; folia 2–3-ternata, interdum cirrhosa, foliolis ellipticis vel ovatis, acuminatis; inflorescentia racemosa, axillaris, bracteis caducis; calyx campanulatus, minute 5-denticulatus; corolla tubulo-infundibuliformis, tubo extus puberulo; stamina thecis divaricatis; ovarium oblongum, puberulum; discus pulvinatus.

Liana; branchlets terete, glabrate, finely striate, elenticellate or with inconspicuous elongate lenticels; nodes without interpetiolar glandular fields or pseudostipules. Leaves 2–3-ternate, the terminal 3 leaflets sometimes replaced by a simple tendril; leaflets elliptic to ovate, acuminate, the base cuneate to truncate, chartaceous, 4–15 cm long, 1.5–7 cm wide, very minutely and inconspicuously scattered lepidote or lepidote-papillose above and below, otherwise glabrous or very sparsely and minutely subpuberulous along midvein below, drying olive with contrasting yellowish or reddish main veins below, the main veins plane

above, prominent below; petiolules and petiole glabrous or subpuberulous adaxially. Inflorescence an axillary raceme, puberulous, the bracts early deciduous, 2–3 mm long, 2–3 mm wide, yellowish puberulous and glandular, bracteoles absent. Flowers with the calyx campanulate, truncate, minutely 5-denticulate, 10–13 mm long, 6–9 mm wide, densely yellow-tomentose with branched trichomes, with scattered black-drying glands in upper half; corolla tubular-infundibuliform, ca. 4 cm long (mature corollas seen all shrivelled and partially destroyed), densely puberulous outside and on lobes inside, with plate-shaped glands at base of lobes outside, the tube mostly glabrous inside, densely villous at and below level of stamen insertion; stamens inserted 12–13 mm above base of corolla tube, the filaments 1.1–2.1 cm long, the anther thecae divaricate, 2.5–3 mm long; pistil 3.2–3.3 cm long, the style puberulous with branched trichomes, the ovary oblong, 3 mm long, 1 mm wide, densely puberulous; disc annular-pulvinate, 1 mm long, 2.5 mm wide.

TYPE: BRAZIL. AMAZONAS: Manaus, km 10 estrada Manaus-Itacoatiara, trepadeira com flores amarelas na mata de t. firme solo argiloso, 16 May 1972, *Loureiro, Pires & Athanagildo s.n.* (INPA 35794) (INPA, holotype; MO, isotype).

Additional collections examined: VENEZUELA. AMAZONAS: Dept. Apures, Río Orinoco, alrededores de Siquita entre la Isla Castillito y San Fernando de Atabapo, 100–140 m, *Bunting et al.* 3631 (MY). BRAZIL. AMAZONAS: Ducke Forest Reserve, km 26 on Manaus-Itacoatiara road, sterile vine, tendrils simple, stems rough, greenish, 23 Nov. 1974, *Gentry* 12820 (MO, INPA). PARA: Cabeceiras do Rio Uruará, flancos do Planalto Amazonico, municip. de Prainha, cipó ao longo do rio, 11 May 1955, *Fróes* 31881, 31886 (both IAN). Santarém, Rio Maicá, Serra de Taperinha, capoeira do pé da serra, cipó robusto, fruto verde, 5 Feb. 1968, *Silva* 1371 (MG).

This is quite unlike any other species of *Memora* in its large 4-valved capsule, its puberulous style and ovary, its yellowish-red puberulous 5-denticulate calyx, and its puberulous corolla tube. Except for the 2–3-ternate leaves it seems closer to *Adenocalymma comosum* and allies than to other *Memora* species, additional evidence of the artificiality of the separation of *Memora* and *Adenocalymma*.

***Tanaecium apiculatum* A. Gentry, sp. nov.—FIG. 4.**

Frutex scandens; ramuli teretes, sine consociibus glandularum in nodis inter petioles; folia bifoliolata, foliolis ellipticis, apiculatis, leviter lepidotis aliter glabris; inflorescentia floribus in racemo dispositis; calyx tubulosus, lepidotus, minute puberulous; corolla alba, elongato-tubuloso, puberula; stamina subexserta; ovarium lineare, dense lepidotum; fructus juvenis linearis, lepidotus.

Liana; branchlets terete, striate, hollow, glabrous; interpetiolar glandular fields and pseudostipules absent. Leaves 2-foliolate with a (simple?) tendril; leaflets elliptic, sharply apiculate, rounded at the base, 16–18 cm long, 8.5–9 cm wide, membranaceous, lepidote above, inconspicuously scattered-lepidote below, otherwise glabrous, drying gray with a whitish cartilaginous margin, the apiculation with plate-shaped glands; petiolules 1.5–2.7 cm long; petioles 3.2–3.6 cm long, very slightly lepidote. Inflorescence a raceme, minutely lepidote and densely mealy puberulous, the rachis ca. 20 cm long, the pedicels ca. 0.5 cm long, the bracts triangular, 3–4 mm long, 3 mm wide, glandular, caducous in bud. Flowers with the calyx tubular, very shallowly 5-denticulate, 3.0–3.5 mm long, 6–7 mm



FIGURE 4. *Tanaecium apiculatum* A. Gentry.—A. Inflorescence; $\times \frac{1}{2}$.—B. Leaves; $\times \frac{1}{2}$.
[After Smith 226 (US).]

wide, lepidote and minutely puberulous with stellate trichomes, circumscissile and falling with corolla; corolla white, elongate-tubular, expanded apically, 15–16 cm long, 14–16 mm wide at the mouth, the tube 13–14 cm long, the lobes 2–2.5 cm long, puberulous outside, the lobes glandular-lepidote inside, the tube glabrous inside except for a few lepidote scales at base of filaments, with linear fields of plate-shaped glands near base of lobes outside; stamens didynamous, the anthers subexserted, the thecae 4(?) mm long, the filaments 10–12 cm long, insertion 9 cm above base of corolla tube, staminode 1 mm long, inserted 8.3 cm above base of tube; pistil 14–16 cm long, the ovary linear, the base somewhat widened, densely lepidote, 4–6 mm long, ca. 1 mm wide; disc annular-pulvinate, ca. 1 mm long, ca. 3 mm wide. Very young fruit linear, subterete, 8 cm long, 0.6 cm wide, scattered lepidote and with a few platter-shaped glands.

TYPE: VENEZUELA. MONAGAS: Caicara, important vine of the heavy woods, flowers white, wet woods, “caratero,” 15 May 1952, *Smith 226* (US 2121468, holotype; US 2121469, isotype, MO fragments).

This plant is utterly distinct from any other species of Bignoniaceae. Its elongate tubular white flowers are those characteristic of *Tanaecium* but the long tubular circumscissile calyx is unique in that genus. Cartilaginous leaflet margins are also unique in *Tanaecium* although found in several species of *Adenocalymma*; the striking terminal apiculations of the leaflets of this species are found in no other species of Bignoniaceae.

Tynnanthus villosus A. Gentry, sp. nov.—FIG. 5.

Frutex scandens, in omnes partes villosus, sine consociibus glandularum in nodis inter petioles; pseudostipulae foliaceae; folia bifoliolata, foliolis oblongo-ellipticis; inflorescentia floribus in panícula axillari dispositis; calyx cupulatus, subtruncatus, puberulus; corolla crenea, bilabiata, extus puberula; stamina didynama, thecis divaricatis, flexis; ovarium conicum puberulum; discus deficiens; capsula ignota.

Liana; branchlets terete, striate, villous with ca. 1 mm long reddish yellow trichomes; interpetiolar glandular fields absent; pseudostipules foliaceous, 0.9–1.5 cm by 0.8–1.5 cm. Leaves 2-foliolate with a tendril or tendril scar; leaflets more or less oblong-elliptic, acuminate, the base asymmetrically rounded thus usually subcordate on one side, 5–11 cm long, 3–7 cm wide, membranaceous, the main veins raised below, velutinous below with simple trichomes especially along the main veins, less conspicuously pubescent above, drying olive; petiolules 1–1.5 cm long; petioles 2–4 cm long, conspicuously villous. Inflorescence a racemose axillary panicle, villous, the rachis 4–12 cm long, the short, 2–5 mm long peduncles at right angles to it, each bearing 2–3 flowers and subtended by a narrow caducous bract 2–3 mm long. Flowers with the calyx cupular, subtruncate or minutely 5-denticulate, 1.5–2 mm long, ca. 2 mm wide, pubescent, eglandular; corolla cream (“amarillo blancuzco”), bilabiate, ca. 0.5 cm long, split about half its length, the 2 upper lobes almost fused, the 3 lower ones ca. 2 mm long, puberulous outside, inside puberulous on lower 3 lobes, floor of tube, at level of stamen insertion and on margins of upper 2 lobes; stamens didynamous, the anther thecae 1 mm long, divaricate and reflexed forward from a basal twist, the connec-

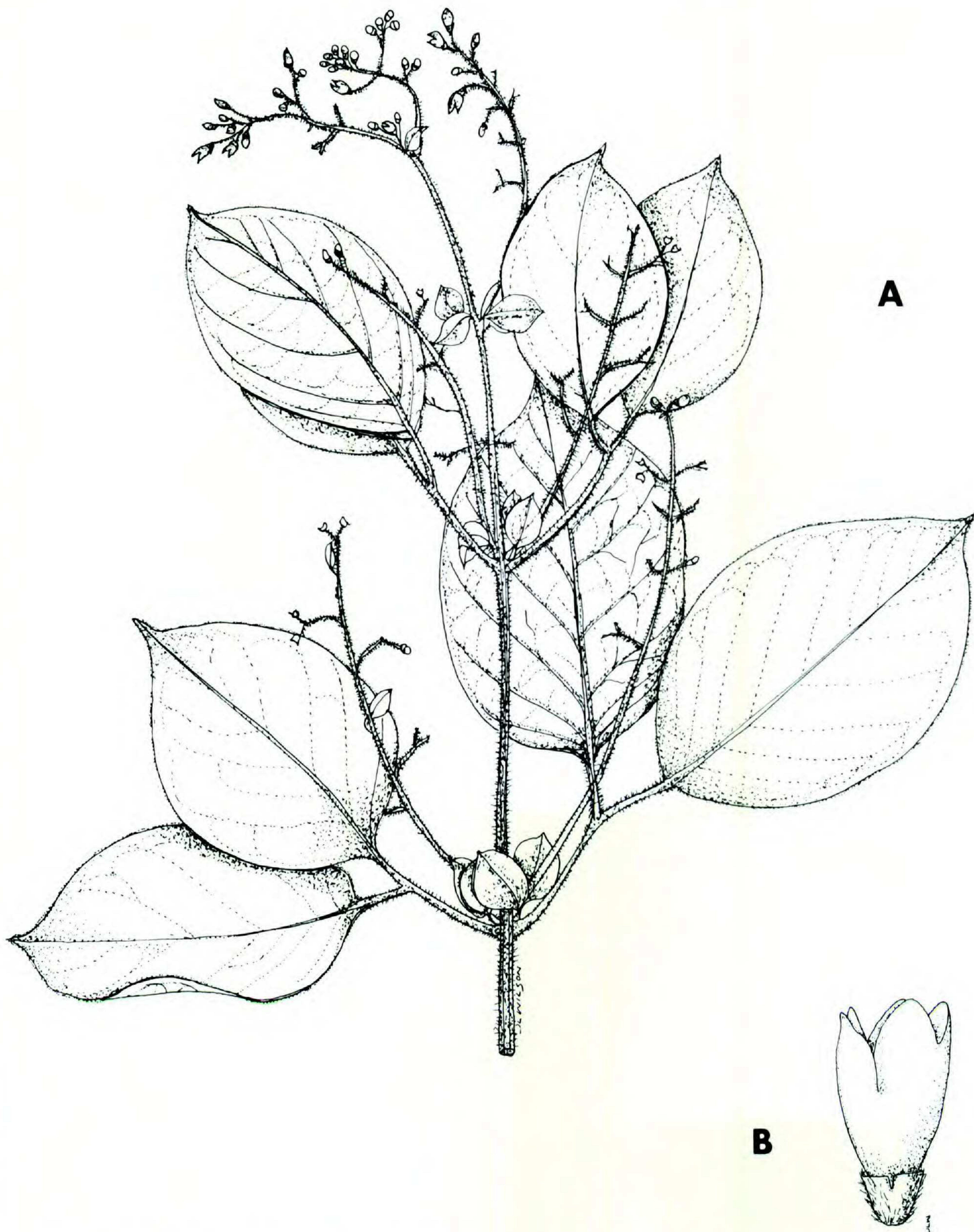


FIGURE 5. *Tynnanthus villosus* A. Gentry.—A. Habit; $\times \frac{1}{2}$.—B. Flower; $\times 5$. [After Schunke 6852 (MO).]

tive extended 0.2 mm beyond anther attachment, the longer filaments ca. 2 mm long, the shorter filaments ca. 1.5 mm long, the staminode 1 mm long, insertion 0.5 mm from base of corolla tube; pistil 3 mm long, the stigma narrow, bilamellate, the style pubescent toward base, the ovary conical, ca. 1 mm long, 1 mm wide at base, densely pubescent, the ovules 3–4-seriate in each locule at bottom of ovary and 2-seriate at top; disc not apparent. Capsule not known.

TYPE: PERU. SAN MARTÍN: PROV. Mariscal Caceres, Dtto. Tocache Nuevo, Quebrada de Canuto, 400 m, liana de 8–9 m, flores amarillo blancuzco, sepalos brilliant yellow-green, en bosque secundario y con abundante luz solar, 18 Aug. 1973, *José Schunke Vigo 6852* (MO, holotype; isotypes to be distributed).

Additional collection examined: PERU. HUANUCO: Hills E of Tingo Maria, sterile liana, *Croat 21121* (MO).

This unmistakable plant has no obvious affinities with other species of *Tynnanthus*. It differs markedly from all other species of the genus in its shaggy indumentum, its narrow almost racemose inflorescence, and its persistent foliaceous pseudostipules. Foliaceous pseudostipules are occasionally also found in the very different *Tynnanthus myrianthus* Bur. & K. Schum., but mostly on young branchlets.

Tecoma pedicellata Bur. & K. Schum. in Mart. Fl. Bras. 8(2): 336. 1897.

Handroanthus pedicellatus (Bur. & K. Schum.) Mattos, Loefgrenia 50: 4. 1970.

Bureau and Schumann noted the close relationship of their new species, actually a *Tabebuia*, with *Tabebuia chrysotricha* (Mart. ex DC.) Standl. but considered it distinct on account of its longer pedicels, smaller corolla and calyx, and different calyx indumentum. The species is known only from the type collection, *Glaziou 1476* from Corcovado, Rio de Janeiro, Brazil. Presumably the holotype at Berlin has been destroyed. Isotypes at BR, K, and P have flowering branchlets resembling *Tabebuia ochracea* (Cham.) Standl. detached from branchlets with leaves identical to those of *Tabebuia chrysotricha*. Could the Glaziou gathering be a mixture of these two species? A second isotype at Paris proves the suspicion well founded. This sheet has, in addition to two detached flowering branchlets resembling *Tabebuia ochracea*, a branchlet bearing both leaves and flowers. The attached flowers are those of *Tabebuia chrysotricha*, and *T. pedicellata* is indeed based on a mixed collection. I propose that *Tecoma pedicellata* be rejected under Article 70 of the Code of Nomenclature since the name was based on a type consisting of two or more discordant elements.

ONOHUALCOA & MANSOA

Mansoa verrucifera (Schlecht.) A. Gentry, comb. nov.

Bignonia verrucifera Schlecht., Linnaea 26: 655. 1853. TYPE: Venezuela, Curucati, *Wagner 307* (not seen).

Onohualcoa verrucifera (Schlecht.) A. Gentry, Ann. Missouri Bot. Gard. 60: 885. 1974 (1973). (Includes complete synonymy.)

The monotypic genus *Onohualcoa* has been characterized (Sandwith, 1947) by its trifold tendril, rugose-warty calyx with ribs ending in subulate teeth, pink corolla, and tuberculate-echinate capsule. Dugand (1946) noted the differences between *Onohualcoa* (as *Bayonia*) and *Adenocalymma*, *Pseudocalymma* (now included in *Pachyptera*), *Chodanthus* (now included in *Mansoa*), and *Petastoma* (now included in *Arrabidaea*). He separated his *Bayonia* from *Chodanthus* by the latter's lack of prominent calyx ribs and tubercles on its capsules, although

noting that the fruit is otherwise similar. The other genera mentioned by Dugand are clearly less closely related. Sandwith (1947) emphasized that *Onohualcoa* should be compared with *Mansoa* with a similar inflorescence but a smooth elongate-linear capsule.

I have previously (Gentry, 1974a) accepted Sandwith's interpretation of *Onohualcoa* but united the two species recognized by him. On the other hand, Standley & Williams (1974) inexplicably sink *Onohualcoa* back into utterly unrelated *Adenocalymma*.

Recently I was able to see *Mansoa difficilis* (Cham.) Bur. & K. Schum. in flower in the field and was surprised by its striking resemblance to *Onohualcoa*. A reexamination of the differences separating *Onohualcoa* and *Mansoa* shows that they are very closely related and should be united. In addition to the general similarity between the two genera (see Fig. 6) in such characteristics as subulate calyx teeth, the peculiar inflorescence, tendency to 3-foliolate leaves and 3-veined leaflets, corolla shape, color and pubescence, trifold tendrils, ovules 2-(4-) seriate in each locule, and large nectariferous disc, may be added two more important similarities.

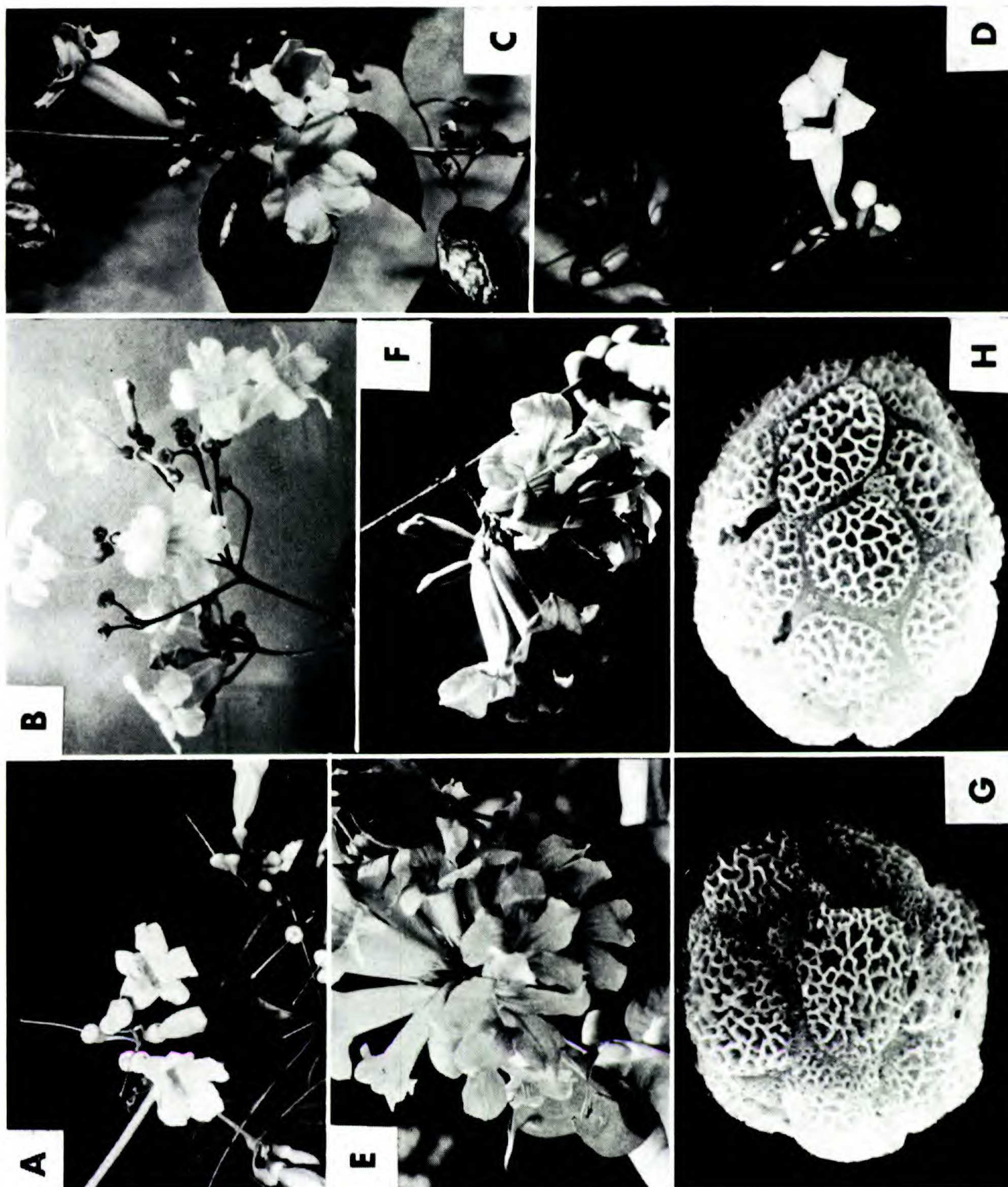
The pollen of *Onohualcoa* has not been described. That of *Mansoa* is of an unusual and very characteristic camporeticulate form with the alveolate exine broken into numerous discrete patches (Fig. 6). The pollen of *O. verrucifera* (Fig. 6) proves to be the same as that of *Mansoa* and strongly supports the union of the two genera (Tombs & Gentry, in preparation).

A second piece of new evidence comes from the capsules of the two genera. *Onohualcoa*'s chief claim to generic rank is its echinate-tuberculate capsule. The known capsules of *Mansoa* are relatively smooth-surfaced, although that of *M. difficilis* usually has raised ridges and may have a beaded almost subtuberculate surface texture. However, fruiting specimens of a new species of *Mansoa* from northeastern Brazil are now at hand which have the same type of echinate-tuberculate surface as *Onohualcoa* (see below). If the fruit of *Onohualcoa* is not unique, then the genus cannot possibly be maintained as distinct. Even were the fruit distinct, merger with *Mansoa* would seem in order—the general trend now emerging in Bignoniaceae (Gentry, 1973, 1974b) is of genera defined by similar floral and vegetative characters with differences in fruits often characterizing only species and varieties.

***Mansoa onohualcoides* A. Gentry, sp. nov.**

Frutex scandens; ramulis teretibus, sine consociibus glandularum in nodis inter petioles; folia trifoliolata vel bifoliolata cum cirrho trifido, foliolis ovatis vel ellipticis, fere glabris; inflorescentia anguste paniculata, axillaris; calyx cupulatus, 5-setaceus setis 1–2 mm longis, puberulus; corolla tubulo-infundibuliformis, tubo extus glabro; ovarium anguste oblongum, lepidotum vel lepidoto-tuberculatum; discus pulvinatus; capsula anguste oblonga, teres, verrucoso-tuberculata, seminibus bialatis.

Vine; branchlets terete, finely striate, with minute round whitish lenticels; nodes without interpetiolar glandular fields or pseudostipules. Leaves 2–3-foliolate, sometimes with a trifold tendril; leaflets narrowly ovate to elliptic, acute to acuminate, the base rounded to truncate, chartaceous, 2–11 cm long, 1–5 cm wide,



distinctly scattered-lepidote above and below, otherwise glabrous or subpuberulous at base of midvein above and below, with clusters of plate-shaped glands in lower nerve axils below, drying olive to blackish olive, the main veins plane above, prominent below; petiolules 0.3–2.5 cm long; petioles 0.5–3 cm long, puberulous. Inflorescence very narrowly paniculate, the lateral branches each 2–3-flowered, puberulous, ebracteate. Flowers with the calyx cupular, 5–8 mm long (without teeth), 5–6 mm wide, basically truncate, 5-setate, the subulate teeth 1–2 mm long, very briefly extended as ridges near apex of calyx, puberulous; corolla tubular-infundibuliform, 4–4.5 cm long, the tube 3–3.5 cm long, the lobes ca. 1 cm long, the tube mostly glabrous outside, becoming sparsely puberulous toward top, glabrous inside except at level of stamen insertion, the lobes puberulous outside and inside; stamens didynamous, included, inserted 7–8 mm above base of corolla tube, the filaments ca. 2.5 cm long, the anther thecae divaricate, 4 mm long, the connective slightly extended; pistil 3 cm long, the ovary linear-oblong, 2.5–3 mm long, 1 mm wide, slightly narrowed toward base and apex, densely minutely lepidote or lepidote-tuberculate, the ovules 4-seriate in each locule; disc patelliform, 0.5–1 mm long, 1.5–2 mm wide. Capsule linear-oblong, subterete, verrucose-tuberculate, the enations ca. 1 mm long, ca. 15 cm long, 1.4 cm wide; seeds bialate, 0.7–0.9 cm long, 2.5–3.5 cm wide, the wings hyaline-membranaceous, clearly demarcated from rather thick brown seed body.

TYPE: BRAZIL. CEARÁ: Serra de Baturité, Quebradas occidentâes perto do sertão de Canindé, 24 Aug. 1908, *Ducke s.n.* (MG1594) (MG, holotype).

Additional collections examined: BRAZIL. CEARÁ: Guaramiranga, Matta, "cipo de cesto," 20 July 1908, *Ducke s.n.* (MG1356) (MG). PERNAMBUCO: Brejo de S. José, planta n. 5, 7 Sep. 1960, *Lima 60-3525* (RB). MARANHÃO: Maracassumé River region, Campo do Casins, *Froes 1857* (MO, NY).

This species is somewhat intermediate between *M. difficilis* (Cham.) Bur. & K. Schum., which ranges through most of eastern Brazil, and *M. verrucifera*, which ranges from Mexico to Guyana and south along the Andes to Acre, Brazil. The verrucose-tuberculate fruit is like that of *M. verrucifera* but narrower and with thinner, nonwoody capsule valves and smaller, more widely separated echinations; the thinness of the valves suggests *M. difficilis*, however. Immature fruits are more densely echinate and exactly like those of *M. verrucifera*. The flowers could easily be confused with either *M. difficilis* or *M. verrucifera* but the abbreviated (or absent) calycine ridges, nonverrucose calyx surface, and almost glabrous corolla tube suggest the former. The nonribbed lenticellate branchlets

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FIGURE 6. *Anemopaegma* and *Mansoa*.—A, D. *Anemopaegma*; B–C. *Pseudopaegma*.—A. *orbiculatum* (Jacq.) DC.; $\times \frac{5}{18}$.—B. *A. oligoneuron* (Sprague & Sandw.) A. Gentry; $\times \frac{10}{27}$.—C. *A. longidens* DC.; $\times \frac{1}{3}$.—D. *A. chrysoleucum* (H.B.K.) Sandw.; $\times \frac{5}{18}$.—E, G. *Mansoa*; F, H. *Onohualcoa*.—E. *M. difficilis* (Cham.) Bur. & K. Schum.; $\times \frac{10}{27}$.—F. *M. verrucifera* (Cham.) A. Gentry; $\times \frac{7}{27}$.—G. Pollen of *M. difficilis*; $\times 780$.—H. Pollen of *M. verrucifera*; $\times 940$. Note the similarity of flower shape in *Anemopaegma* and *Pseudopaegma* (A–D) and *Mansoa* and *Onohualcoa* (E–F), the subtruncate calyx like that of *Anemopaegma* in B, and the camporeticulate pollen of both *Mansoa* and *Onohualcoa* (G–H).

are unlike *M. difficilis*; branchlets of *M. verrucifera* are similar but less noticeably lenticellate. Pinnately veined leaflets with gland fields in the axils of several secondary nerves below are different from either species. *Mansoa onohualcoides* provides the heretofore missing link between *Onohualcoa* (i.e., *M. verrucifera*) and other species of *Mansoa*.

In addition to the cited specimens from northeastern Brazil, a collection from southern Venezuela closely resembles *M. onohualcoides* and may be conspecific. The Venezuela collection [*Lizot 90* from Mavacca, Territorio Amazonas (VEN)] has a shorter more noticeably branched inflorescence, lacks conspicuous lenticels, and has leaflets without glandular fields in the nerve axils below, not notably lepidote, and drying reddish black.

PSEUDOPAEGMA & ANEMOPAEGMA

Urban (1916) proposed *Pseudopaegma* as a segregate from *Anemopaegma* based mainly on the 5–6-colpate pollen of the former versus the ecolpate pollen of the latter. However, Gomes (1955) subsequently described the pollen of *Anemopaegma* (based on *A. pachyphyllum* and *A. hilarianum*, species not examined by Urban) as 5–7-colpate and additional species of that genus also prove to have several-colpate pollen like that of *Pseudopaegma* (Tombs & Gentry, in preparation). Clearly pollen does not support generic segregation.

A second character used by Urban to distinguish *Pseudopaegma* from *Anemopaegma* was the presence of subulate calyx teeth in the former but not the latter. However, Sprague & Sandwith (1932) and Sandwith (1955) later undermined this character by describing additional species of *Pseudopaegma* lacking subulate calyx teeth (cf. Fig. 6). Sandwith (1955) went so far as to note that “the length of subulate calyx teeth is suspect [even] as a specific character.” The Venezuelan plant described here further proves this point. It usually has quite distinct calyx teeth 2–3 mm long but these are submarginal and sometimes hardly exceed the calyx margin.

A third character separating *Pseudopaegma* from *Anemopaegma* was proposed by Sandwith (1955) who noted the presence of interpetiolar glandular fields only in the former. Interpetiolar glandular fields are a notoriously variable character, even from node to node on the same plant, and are rarely visible on species of *Pseudopaegma* with puberulous branchlets. Moreover, these glands are not present in the new species which is definitively linked to *Pseudopaegma* by its subulate calyx teeth.

Apparently the fruits of none of the six species attributed to *Pseudopaegma* by Sandwith have been described. The fruits of three *Pseudopaegma* species (*P. oligoneuron*, *P. longidens* and the Venezuelan plant) are now at hand and all prove to have the same very characteristic form as those of *Anemopaegma*. In all other characteristics the two genera are also exactly the same (cf. Fig. 6).

There seems to be no basis for continued segregation of *Pseudopaegma* and I propose that it be reduced to synonymy under *Anemopaegma*. Four new combinations are necessary.

Anemopaegma colombianum (Sandw.) A. Gentry, comb. nov.

Pseudopaegma colombianum Sandw., Kew Bull. 1953: 473. 1954. TYPE: Colombia, Meta, Cuatrecasas 4605 (COL, K, US).

Anemopaegma insculptum (Sandw.) A. Gentry, comb. nov.

Pseudopaegma insculptum Sandw., Kew Bull. 1954: 608. 1955. TYPE: Colombia, Amazonas, Garcia-Barriga 14617 (COL, K, US).

Anemopaegma oligoneuron (Sprague & Sandw.) A. Gentry, comb. nov.—FIG. 6.

Pseudopaegma oligoneuron Sprague & Sandw., Kew Bull. 1932: 88. 1932. TYPE: British Guiana, Upper Demerara River, Jenman 4070 (K).

Anemopaegma mirabile (Sandw.) A. Gentry, comb. nov.

Pseudopaegma mirabile Sandw., Kew Bull. 1953: 474. 1954. TYPE: Brazil, Piauhy, Gardner 2679 (BM, K).

Anemopaegma alatum A. Gentry, sp. nov.

Frutex scandens, ramulis teretibus, sine consociibus glandularum in nodis inter petioles; folia trifoliolata vel bifoliolata cum cirrho trifido, foliolis ovatis, lepidoto-puncticulatis, leviter puberulis; inflorescentia racemosa, axillaris; calyx campanulatus, 5-dentatus dentibus submarginalibus 2–3 mm longis, puberulus; corolla aurata, tubulo-campanulata, tubo glabro; ovarium ovoideum, basilater contractum; discus pulvinatus; capsula elliptica, complanata, puberula, seminibus suborbiculatis.

Liana; branchlets terete, finely striate, puberulous, elenticellate; interpetiolar glandular fields absent; pseudostipules minutely foliaceous, deciduous. Leaves 2–3-foliolate, the tendrils trifid; leaflets ovate, acute, rounded to shallowly cordate at base, 5–8.5 cm long, 3–6.5 cm wide, chartaceous, conspicuously lepidote-punctate above and below, puberulous along midvein above and main veins and very sparsely over surface below, the margin sometimes subciliate, drying olive to yellowish olive; petiolules 0.2–1.4 cm long; petioles 2.8–3.8 cm long, densely puberulous. Inflorescence an axillary raceme, the rachis and pedicels puberulous, the pedicels ca. 1 cm long. Flowers with the calyx campanulate, conspicuously 5-toothed (“5-winged” when fresh), the margin basically truncate, the subulate teeth submarginal, 2–3 mm long, extended as calycine ridges, 7–10 mm long (with teeth), 7–8 mm wide, puberulous and lepidote, also with plate-shaped glands below margin; corolla tubular-campanulate above a narrowly tubular basal portion, 5–6 cm long, 1.2–1.8 cm wide at mouth of tube, the tube 4.5–5 cm long, the lobes 0.7–0.9 cm long, the tube glabrous outside, the lobes ciliate, otherwise glabrous, the tube glabrous within except at and below level of stamen insertion, sometimes with plate-shaped glands below lobes outside; stamens didynamous, the thecae divaricate, 3–4 mm long, the longer filaments 1.9–2 cm long, the shorter filaments 1.3–1.5 cm long, the staminode 3 mm long, insertion 20–23 mm from base of corolla tube; pistil 4.3–4.4 cm long, the ovary ovoid, 2–3 mm long, 1.5 mm wide, papillose-lepidote, long-stipitate, the stipe 1 mm long and 0.7 mm wide, the ovules irregularly 4-seriate (appearing 2-seriate in cross section) in each locule; disc cylindrical, 1.5 mm long, 2 mm wide. Capsule elliptic, thin-valved, flattened, acute at both ends, 5.5–7 cm long, 3–4 cm wide, the midline not at all raised, puberulous, also with scattered plate-shaped glands, drying tannish, the calyx persistent; seeds thin, suborbicular, the wing surrounding body

of seed, 2–2.6 cm long, 2.8–4 cm wide, outer margin of wing hyaline-membranaceous, this distinctly demarcated from the brownish basal portion which is poorly demarcated from the seed body.

TYPE: VENEZUELA. SUCRE: Distrito Sucre, between La Sabana, Los Altos, and La Silleta, towards Zurita, 600 m, corolla yellow and white, 18 Aug. 1973, *Steyermark et al.* 107753 (MO, holotype; VEN, isotype).

Additional collections examined: VENEZUELA. BOLÍVAR: Pequeña meseta del Norte de Serranía Cararubán, SE de Canaima, 6°15', 62°47', 300–600 m, trepadora, petalos amarillos, caliz verde, 5-alado, vista también en la sabana, 19 Feb. 1964, *Agostini* 386 (NY, VEN). Río Carrao, Alto Caroní, alrededores de Salto Hacho, 6°15'N, 62°51'W, 350 m, Mar. 1954, *Cardona* 2868 (US). Río Paragua, Salto de Auraima, 275 m, woody vine, corolla tube yellow, lobes white, common at edge of river in this part, 18 Apr. 1943, *Killip* 37544 (NY, US). MONAGAS: Selvas del Río Sabaneta, cerca del pueblo de Quiriquire, trepadora de flores blanco-cremoso, crece al margen de la selva, 9 Aug. 1955, *Lasser & Vareschi* 4089 (VEN).

This plant keys to *A. jucundum* in Sandwith's key but is most closely related to *A. longidens* on the basis of its conspicuous rather thick calyx teeth, glabrous corolla tube, and only slightly pubescent leaves. It differs from *A. longidens* in lacking glandular fields at the nodes, having subfoliaceous pseudostipules, leaflets densely punctate-lepidote and puberulous along main veins (and slightly over surface) beneath, slightly shorter calyx teeth (2.5–5 mm long in *A. longidens*), and smaller fruit. In addition its leaves dry olive instead of green and the base of the corolla tube is cylindrical rather than flared out around the ovary as in *A. longidens*. *Anemopaegma alatum* is also close to *A. maguirei* Sandw. of Surinam, the type of which has a shorter (4–6 mm long) calyx similarly pilose pubescent but with a sinuate, scarcely denticulate, margin and lepidote-punctate leaves. That species also differs from *A. alatum* in the corolla tube densely lepidote outside, shorter petiolules (2–4 mm long), and lack of subfoliaceous pseudostipules. Treatment of the Venezuelan plant as conspecific with *A. maguirei* is certainly not possible even though a collection [*Cowan* 39224 (NY) from British Guiana, determined as *A. maguirei* by Sandwith] somewhat intermediate between *A. maguirei* and *A. alatum* exists. The Cowan collection has a larger (10 mm by 8–9 mm) calyx than *A. maguirei* with minute but definite submarginal denticulations, and the corolla tube is scattered-lepidote outside. It is unlike both *A. maguirei* and *A. alatum*, especially in having its leaflets only very slightly (not densely) punctate lepidote beneath, although its short (2–4 mm) petiolules match those of the former; its glabrous (except for a few trichomes near margin) calyx is also unlike both of the other plants. This may represent yet a third species whose relationship with *A. parkeri*, another species with glandular-lepidote corolla tube, must be considered.

The Venezuelan plant is now represented by 5 different collections, all of which are quite homogeneous (one lacks foliaceous pseudostipules). Several of these were variously determined (with queries) by Sandwith as *A. carrerense* (= *A. karstenii* Bur. & K. Schum., *Cardona* 2868), *A. parkeri* (*Agostini* 386), and *Pseudopaegma* sp. cf. *P. oligoneuron* (*Killip* 37544) but the relationships seem instead with *A. longidens* and *A. maguirei*.

Anemopaegma patelliforme A. Gentry, sp. nov.

Frutex scandens; ramulis teretibus, sine consociibus glandularum in nodis inter petioles; folia trifoliolata vel bifoliolata cum cirrho, foliolis ovatis, plerumque glabratiss, petiolulis lateralibus 0.8–1.2 cm longis, petiolis 4–10 cm longis; inflorescentia racemosa, axillaris brevis; calyx patelliformis, truncatus, puberulus; corolla aurata, tubulo-campanulata, tubo lepidoto; ovarium oblongo-ellipticum, lepidotum, basaliter contractum; discus pulvinatus; capsula ignota.

Liana; branchlets terete, finely striate, glabrate; interpetiolar glandular fields absent; pseudostipules spathulate-foliaceous, to 5 mm long, 2 mm wide, caducous. Leaves 3-foliolate or 2-foliolate with a simple (?) tendril; leaflets ovate, acute to acuminate, the base rounded to very broadly cuneate, 10–15 cm long, 5–7.5 cm wide, membranaceous to chartaceous, the main veins slightly raised above, prominent below, scattered impressed-lepidote, otherwise mostly glabrous, usually with a few minute inconspicuous trichomes scattered along main vein above and below, with conspicuous clusters of plate-shaped glands in axils of lateral nerves below, drying olive; lateral petiolules 0.8–1.2 cm long, the terminal petiolule to 3.5 cm long; petioles 4.0–10 cm long, puberulous. Inflorescence a short 4–7-flowered axillary raceme, the pedicels and rachis puberulous. Flowers with the calyx expanded-campanulate, truncate, ca. 3 mm long, 6–8 mm wide, minutely puberulous, with plate-shaped glands in upper half; corolla yellow, tubular-campanulate, 4.3–5.2 cm long, 1.4–1.7 cm wide at mouth of tube, the tube 3.5–4 cm long, the lobes 0.7–1.1 cm long, glandular lepidote outside, the lobes mostly glabrous, with a few trichomes along the subciliate margins, the tube inside mostly glabrous, with some glandular-lepidote scales, densely pubescent at level of stamen insertion; stamens didynamous, the anther thecae divaricate, 3 mm long, the longer filaments 1.8–1.9 cm long, the shorter filaments 1.4–1.6 cm long, the staminode 4–5 mm long, insertion 9–10 mm from base of corolla tube; pistil ca. 2.5 cm long, the ovary oblong-elliptic, 2 mm long, 1 mm wide, contracted slightly at base, densely glandular-lepidote, the ovules 4-seriate in each locule in cross section; disc pulvinate, tapering to base of ovary, ca. 1 mm long, ca. 2 mm wide. Capsule unknown.

TYPE: VENEZUELA. AMAZONAS: Mavaca, Alto Orinoco, Indios Guaicas (Yanomano), las flores son utilizadas para adorno en las orejas perforadas de las mujeres, trepadora de flores amarillas, Jan. 1970, *Aristeguieta & Lizot 7374* (VEN, holotype; MO, fragments).

Vegetatively this plant is similar to *A. longipetiolatum* Sprague of Paraguay because of its long petioles. That species is very different in puberulous leaves, much larger narrowly campanulate calyx, and longer inflorescence. The calyx of *A. patelliforme* is reminiscent of that of *Arrabidaea (Petastoma) patellifera* (Schlecht.) Sandw. and matched in *Anemopaegma* only by very different pubescent-leaved *A. oligoneuron* (Sprague & Sandw.) A. Gentry and by *A. insculptum* (Sandw.) A. Gentry. The latter, perhaps the closest relative of *A. patelliforme*, lacks lepidote scales on the outside of the corolla as well as having shorter (3–5 cm long) petioles and longer (1.5–2 cm long) lateral petiolules. *Anemopaegma insculptum* also differs in having interpetiolar glandular fields and lacking glandular fields in the axils of the lateral nerves below.

Anemopaegma villosum A. Gentry, sp. nov.

Frutex scandens; ramuli teretes, villosi, sine consociebus glandularum in nodis inter petioles; pseudostipulis foliaceis; folia 2-foliolata, foliolis ellipticis, acutis, subtus villosis; inflorescentia floribus 1–3 in axillis foliorum dispositis; calyx cupulatus, fere membranceous, truncatus; corolla tubulo-campanulata, tubo extus lepidoto; stamina thecis divaricatis; ovarium ellipsoideum, lepidotum; discus pulvinatus; capsula ignota.

Vine; branchlets terete, finely striate, villous; interpetiolar glandular fields absent; pseudostipules thinly foliaceous, elliptic, acute, 5–15 mm long, 2–8 mm wide, noticeably veined. Leaves 2-foliolate, often with a minutely trifid tendril; leaflets ovate, acute to short-acuminate, rounded to truncate at base but often abruptly attenuate at top of petiole, 6.5–9 cm long, 3.5–5.5 cm wide, membranaceous, pubescent with scattered trichomes above, villous beneath, especially along main veins, the trichomes to almost 1 mm long, drying olive; petiolules 1.5 cm long; petioles 2 cm long, villous. Inflorescence 1–3 axillary or terminal flowers, the pedicels pilose, 4–7 mm long. Flowers with the calyx cupular, almost membranaceous, truncate, 5–6 mm long, 5 mm wide, appressed-pilose, eglandular; corolla “yellow with white,” tubular-campanulate, 4.5 cm long, 1.4–2 cm wide at mouth of tube, the tube 4 cm long, the lobes ca. 0.7 cm long, conspicuously glandular-lepidote outside and on lobes and upper part of tube inside, sparsely pubescent at level of stamen insertion; stamens didynamous, inserted 6–7 mm above base of corolla tube, the filaments 1.5–2 cm long, the anther thecae divaricate, 3 mm long; ovary ellipsoid, slightly narrowed at base, 2 mm long, 1 mm wide, densely minutely lepidote; disc conical pulvinate, 1 mm long, 1.5 mm wide. Capsule not known.

TYPE: VENEZUELA. PORTUGUESA: Selva tropófila sobre peñasco calcáreo, 5 km este-noreste de Agua Blanca 22 km noreste de Acarigua, 190 m, twining around shrubs on bluffs, corolla yellow with white, leaves membranaceous, gray green below, 24 Aug. 1966, *Steyermark & Rabe* 96455 (VEN, holotype; NY, US, isotypes).

This species is most closely related to *A. rugosum* (Schlecht.) Spr. which differs in conspicuously bullate leaflets, obtuse pseudostipules, a more coriaceous calyx, and especially a pilose indumentum of stiff erect trichomes on leaves and branchlets. *Anemopaegma rugosum* is known only from altitudes of 600–1,300 m in Distrito Federal and Aragua State.

SANHILARIA & PARAGONIA

Paragonia brasiliensis (H. Baill.) A. Gentry, comb. nov.

Sanhilaria brasiliensis H. Baill., Hist. Pl. 10: 27. 1888 (1891).

Examination of the type specimen of Baillon's monotypic genus indicates that it is very similar to *Paragonia pyramidata* (L. Rich.) Bur., the only species of *Paragonia*. There can be no doubt that *Sanhilaria* and *Paragonia* are synonymous. The question which must be resolved is whether *Sanhilaria brasiliensis* is even specifically distinct from *P. pyramidata*.

The type collection of *S. brasiliensis*—*St. Hilaire 745* (P) from Minas Gerais, Brazil—has all essential characters of *Paragonia*, including the characteristic subulate pseudostipules. It differs from *P. pyramidata* in its softly puberulous short-petioled leaves, narrower inflorescence, and especially in the conspicuously costate almost winged calyx; no corollas are extant. A second sheet of the same collection has an immature fruit which is more compressed than in *P. pyramidata* and lacks the characteristic sandpaperlike surface of that species. The fruit of *Sanhilaria* is densely lepidote. Another collection of *Sanhilaria* is now at hand (*Heringer 10277*, Jequié, Bahia, Brazil (NY)) and has corollas exactly like those of *P. pyramidata* except for the acute corolla lobes. This collection has glabrous leaflets but the leaves are otherwise similar to those of the type in their small size, narrowly elliptic shape, and very short petioles and petiolules. A third collection of *Sanhilaria*, also from Bahia (Serra da Agua de Rega, 28 km N of Seabra, 1000 m, *Irwin et al. 31159* (MO)), was originally misidentified by me as *Adenocalymma* sp. This collection is in young fruit and the fruits are densely lepidote, smooth-surfaced, and strongly compressed. The characteristic costate calyx is persistent on one of them. The leaflets of the Irwin et al. collection are glabrous (except for lepidote scales) as in the Heringer collection and have the characteristic narrowly elliptic shape and blunt apex of *Sanhilaria*. As in the other two *Sanhilaria* collections, the petioles and petiolules are extremely short to essentially nonexistent.

Paragonia pyramidata also occurs in Brazil ranging southward to Rio Grande do Sul. However, I have seen no collection of *P. pyramidata* which approaches *Sanhilaria* in leaf form, the species differing constantly in having much longer petioles and petiolules and a wider ovate or elliptic-ovate leaflet. *Paragonia pyramidata* is known from Goias and the Distrito Federal where it typically has its leaves softly puberulous below as in the type of *Sanhilaria*. I regard such variation in pubescence as taxonomically unimportant. Collections of *P. pyramidata* from Brazil all have the convex sandpaper-surfaced capsule valves, broadly paniculate inflorescences, and ecostate calyces characteristic of the species.

The evidence supports recognition of *Sanhilaria brasiliensis* as a distinct species and the new combination *Paragonia brasiliensis* (Baill.) A. Gentry is necessary.

The two species of *Paragonia* may be separated by the characters listed in Table 1.

NESTORIA, KUHLMANNIA & PLEONOTOMA

Pleonotoma albiflora (Salzm. ex DC.) A. Gentry, comb. nov.

Bignonia albiflora Salzm. ex DC., Prodr. 9: 167. 1845. TYPE: Brazil, Bahia, *Salzmann 346* (G-DC, P).

Memora albiflora (Salzm. ex DC.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863.

M. obtusifoliolata Bur. & K. Schum. in Mart., Fl. Bras. 8(2): 261. 1896. TYPE: Brazil, Bahia, *Riedel 750* (K, P).

Nestoria obtusifoliolata (Bur. & K. Schum.) Urb., Ber. Deutsch. Bot. Ges. 34: 752. 1916.

N. albiflora (Salzm. ex DC.) Sandw., Candollea 7: 248. 1936.

Kuhlmannia colatinensis J. C. Gomes, Arq. Serv. Florest. 10: 201, fig. 1. 1956; Notul. Syst. (Paris) 15: 224, fig. 2. 1956. TYPE: Brazil, Espirito Santo, *Kuhlmann 6567* (RB, MO).

TABLE 1. Contrasting features of *Paragonia pyramidata* and *P. brasiliensis*.

<i>P. pyramidata</i>	<i>P. brasiliensis</i>
Tendril tip minutely bifid (rarely trifid)	Tendril tip minutely trifid
Petioles and petiolules well developed	Petioles and petiolules reduced, subobsolescent
Leaflets elliptic or ovate-elliptic, the apex obtuse to acuminate	Leaflets narrowly elliptic to oblanceolate, the apex obtuse
Calyx ecostate	Calyx conspicuously ridged (cf. <i>Fridericia</i>)
Inflorescence broadly paniculate	Inflorescence racemose-paniculate
Capsule subterete, sandpaper-surfaced	Capsule strongly compressed, smooth-surfaced, densely lepidote (immature)
Corolla lobes rounded	Corolla lobes acute
Mexico to southern Brazil	Eastern Brazil (Bahia and Minas Gerais)

The monotypic genus *Nestoria* was segregated from *Memora* by Urban (1916) on the basis of its trifid tendril and tricolpate pollen. Bureau & Schumann (1896–1897) had earlier suggested that its single species seemed out of place in *Memora* because of its *Anemopaegma*-like flower and open inflorescence. Sandwith (1936) pointed out that the pollen and tendril characters used by Urban to segregate *Nestoria* were just those of *Pleonotoma* which likewise has biternate leaves and similar white or cream corollas. However, he retained *Nestoria* as rather doubtfully distinct from *Pleonotoma* on the basis of its many-ribbed rather than tetragonal branchlets and its “remarkable inflorescence.” These characters are insufficient for generic segregation in my opinion.

The Salzmann type collection of *Nestoria albiflora* does have conspicuously tetragonal branchlets with the four angles ribbed and contrastingly lighter colored than the rest of the branchlet. This tetragonal branchlet is readily visible even in the Field Museum photograph (negative 7674) of the type and is just that of *Pleonotoma*. The Salzmann collection is obviously very close to *Pleonotoma*. On the other hand the Riedel type collection of *Memora obtusifoliolata* has mostly very inconspicuously, or not at all tetragonal, 6–8-ribbed branchlets. Only above the nodes are the branchlets of this collection clearly tetragonal. The calyces of this collection are also somewhat shorter than those of the Salzmann collection and the leaflets are round-tipped. Nevertheless, the two collections are so similar as to leave little doubt that they are conspecific.

Now we must remember that neither Schumann (collaboration with Bureau being purely nominal) nor Urban had seen the Salzmann collection. *Memora obtusifoliolata* was described from the Riedel collection as having terete branchlets, thus seeming to accord with *Memora* in this important aspect. When Urban surveyed pollen and tendrils of the Bignoniaceae, he discovered that *M. obtusifoliolata* differed from other members of *Memora* as noted previously and consequently erected the monotypic *Nestoria* for it. We may presume that had these

authors seen the more tetragonal-stemmed Salzmänn collection they might have recognized its affinity with *Pleonotoma*, especially as that genus has both the trifid tendrils and 3-colpate pollen which led to Urban's rejection of the species from *Memora*.

Meanwhile Miers, who had seen the Salzmänn collection, had transferred *Bignonia albiflora* to *Memora* rather than to *Pleonotoma* despite the tetragonal branchlets. This is hardly surprising when one remembers that *Memora* and *Pleonotoma* were defined very differently by Miers than by subsequent authors with foliaceous pseudostipules as the major diagnostic character. Species with terete stems and simple tendrils were thus lumped with unrelated species having tetragonal branchlets and trifid tendrils.

We have, then, a species known from two collections, one with quite obviously tetragonal branchlets, the other with 6–8-ribbed subtetragonal or subterete branchlets. We also know that several accepted species of *Pleonotoma* may have inconspicuously tetragonal and even multi-ribbed (though with four ribs more conspicuous) older branchlets. How fundamental is the difference between tetragonal and multi-ribbed branchlets? Evidence from other genera indicates that in several species of Bignoniaceae normally having tetragonal, 4-ribbed branchlets [e.g., *Mussatia hyacinthina* (Standl.) Sandw., *Cydista diversifolia* (H.B.K.) Miers], occasional plants or branches of plants may be perfectly 6-angled and 6-ribbed. The change from 4-angled to 6-angled may be reversed or repeated even on a single branch. Whereas ribbed and angled branchlets may differ fundamentally from unribbed terete ones, the number of ribs is less important, even in species delimitation. The ribbed branchlets of *Nestoria* ally it with *Pleonotoma*.

The inflorescence of *Nestoria* is a very lax open raceme while the typical inflorescence of *Pleonotoma* is a relatively few-flowered and contracted raceme with a different facies. However, such species of *Pleonotoma* as *P. clematis* (H.B.K.) Miers, *P. melioides* (S. Moore) A. Gentry, or *P. jasminifolia* (H.B.K.) Miers may have inflorescences ranging in size from a few flowers to an elongate 18-or-more-flowered raceme with successive flower pairs separated by 3 cm and pedicels at least 2.5 cm long. The inflorescences of these species have exactly the same appearance as that of *Nestoria*.

Additional evidence also supports the affinity of *Nestoria* with *Pleonotoma*. While the tetragonal branchlets of *Pleonotoma* have received all the taxonomic attention, the petioles and petiolules of *Pleonotoma* are also characteristically tetragonal with raised angles. The petiolules (and sometimes the petioles) of *Nestoria*, even in specimens with subterete branchlets, are sharply tetragonal with raised angles just as in *Pleonotoma*.

Another kind of evidence comes from an unexpected source: examination of type material of *Kuhlmannia colatinensis* proves that monotypic genus synonymous with *N. albiflora*. The *Kuhlmannia* type includes the first known fruit of *Nestoria* and this fruit is also similar to that of some species of *Pleonotoma*.

All available evidence (trifid tendril, 3-colpate microreticulate pollen, biternate leaves, inflorescence, flowers, ribbed subtetragonal branchlets, fruit) supports merger of *Nestoria* (and *Kuhlmannia*) with *Pleonotoma*. The single new

combination *Pleonotoma albiflora* (Salzm. ex DC.) A. Gentry reduces two unnecessary and monotypic genera to synonymy.

This rare species has been assumed endemic to eastern Brazil (Bahia and Espirito Santo) so the discovery of a disjunct population in lowland Guyana is entirely unexpected. Nevertheless, I am unable to distinguish from *P. albiflora* a suite of specimens from Venezuela, Surinam, French Guiana, and Amapa, Brazil. Amazingly, the collection from French Guiana was made by Aublet long before the first Brazilian collections. Guyana area collections I have examined are: VENEZUELA. DELTA AMACURO: Río Grande cerca de los límites del Estado Bolívar, *Blanco 498* (VEN). SURINAM: Mapanegebied, Kamp 8, *Vreden 11320* (WAG). FRENCH GUIANA: without locality, *Aublet s.n.* (BM). BRAZIL. Rio Jarí (border of Amapa and Para), Água Branca, *Silva 2459* (IAN). A sterile collection from Amazonas, Brazil [*Gentry & Ramos 13333*, km 120, Manaus-Itacoatiara Road (MO, INPA)] may be a juvenile form of this species.

Two of these collections are in fruit, permitting amplification of Gomes's fruit description. The fruit of *P. albiflora* is linear-oblong, flattened but with rather woody valves, glabrous, 35–51 cm long, 2.1–3 cm wide, acute at base and apex, drying light green. The seeds are very thin, bialate, ca. 1.8 cm long and 7.5 cm wide, drying uniformly brownish except for very narrow hyaline wing tips. The seeds are uniseriate as in *Memora* but unlike other species of *Pleonotoma*. This difference is inadequate for generic segregation of *Nestoria*.

XEROTECOMA & GODMANIA

Godmania dardanoi (J. C. Gomes) A. Gentry, comb. nov.

Xerotecoma dardanoi J. C. Gomes, Rev. Bras. Biol. 24: 405. 1965. TYPE: Brazil, Pernambuco, *Lima 61-3598* (RB).

Gomes compared his monotypic new genus with *Tabebuia* (*Tecoma* to him) because of its arboreous habit, 3-colporate reticulate pollen grains, and palmately compound leaves. He separated it from *Tabebuia* because of its striate, spirally twisted capsule, campanulate-gibbous corolla, barbate anthers, and patelliform calyx. Unfortunately, Gomes overlooked the fact that these are the same characters by which *Godmania* is distinguished from *Tabebuia*. Gomes's illustration of *X. dardanoi* also shows such *Godmania*-like features as attenuate leaflets, curved ovary, very short anther thecae, and a seed with an indeterminate irregular-ended wing.

Through the courtesy of the Jardim Botânico of Rio de Janeiro, I was able to examine the type of Gomes's plant during a recent visit to Rio de Janeiro. It proves to match *Godmania* in all essentials. In fact, it is so close to *G. aesculifolia* (H.B.K.) Standl., the only recognized species of the genus, that its specific separation needs to be justified.

Godmania aesculifolia ranges from Mexico to Venezuela and Bolivia and even into extreme northern Brazil (Roraima, Para) but has not been collected south of the Amazon in Brazil. It is thus disjunct from *G. dardanoi* which occurs in the caatinga of eastern Brazil. The corolla of *G. aesculifolia* is considerably smaller (1.0–1.6 cm long) than that of the caatinga plant (2.5–3.0 cm long)

though of the same peculiar shortly and widely campanulate form and with the same unusual short triangular lobes. The 15–38 cm long fruit of the caatinga plant is shorter than the 45–100 cm long fruit of *G. aesculifolia* and the pubescence is of a different consistency. These differences are adequate to maintain the plant of eastern Brazil as specifically distinct and the new combination *Godmania dardanoi* (J. C. Gomes) A. Gentry is in order.

I have seen two additional specimens of *G. dardanoi* besides the type and the two other collections from Pernambuco cited by Gomes. One of these was collected at Santa Elena in Bahia State (*Zehntner* 378, RB 6383); the second (*P. de Campo Porto s.n.*, RB 29630) is without data. Interestingly enough these two collections have been annotated by Kuhlmann with an unpublished manuscript name as a new species of *Godmania*.

ROSEODENDRON & TABEBUIA

Tabebuia millsii (Miranda) A. Gentry, comb. nov.

Cybistax millsii Miranda, Bol. Soc. Bot. México 26: 129. 1961. TYPE: Mexico, Chiapas, Gómez-Pompa 312 (US).

Roseodendron millsii (Miranda) Miranda, Bol. Soc. Bot. México 29: 43. 1965.

A reconsideration of the relationships of *Roseodendron* with *Tabebuia* makes the former's reduction to *Tabebuia* seem advisable, contrary to my former opinion (Gentry, 1970). The two species of this group known to Seibert were placed by him in *Cybistax* (Seibert 1940a, 1940b). Both had been described in *Tabebuia*. They were distinguished from *Tabebuia* by the striate ovary, costate fruit, thin membranaceous calyx, and capitate inflorescence trichomes. These characters were thought to be closer to those of *Cybistax*, a monotypic genus of Central Brazil and adjacent Peru. Miranda subsequently described a third species of the alliance in *Cybistax* as *C. millsii*. Later (Miranda, 1965) he correctly noted that the relationship of these species with *Cybistax* is only superficial. He erected for them the new genus *Roseodendron*, separated from *Cybistax* by the more delicately membranaceous, narrower, ecostate calyx, narrowly oblong, estipitate ovary, and indumentum of branched trichomes and lepidote scales with raised borders. He might also have mentioned *Roseodendron*'s much narrower linear fruit with relatively inconspicuous ribs, very different from the oblong fruit with narrow, raised, 1–5 mm thick ribs of *Cybistax*.

Clearly *Roseodendron* is much closer to *Tabebuia* than to *Cybistax*. Indeed all of the characters (except calyx texture) noted by Miranda as distinguishing *Roseodendron* from *Cybistax* are also characteristic of *Tabebuia*.

Discovery of the fruits of *Tabebuia guayacan* (Seem.) Hemsl. and *T. capitata* (Bur. & K. Schum.) Sandw. [especially a form of the latter from Peru, *Castillo* 37-MCS (WIS)] lessens the importance of the capsule ribs of *Roseodendron* as a generic character. *Tabebuia capitata* has varyingly striate fruits as does *T. heptaphylla* (Vell.) Toledo (see Gentry, 1975), while *T. guayacan* has irregularly muricate-reticulate or interruptedly costate fruits. Indeed, these fruits can be more costate than that of *Roseodendron chrysea* (i.e., *Tabebuia chrysea* Blake).

Capitate trichomes are a notoriously variable characteristic in Bignoniaceae

and many natural genera (e.g., *Arrabidaea*, *Lundia*, *Mansoa*, *Piriadacus*) have species both with and without capitate trichomes. Their presence in *Roseodendron* does not merit its generic segregation. The thinner calyx of *Roseodendron* is less different from that of *Tabebuia* in fresh material than in the herbarium. In any case it too differs only in degree from the relatively large thin calyces of such *Tabebuia* species as *T. elliptica* (DC.) Sandw. and wet-forest forms of *T. chrysantha* (Jacq.) Nichols. The well-developed central axis of the inflorescence of *Roseodendron* is, in my opinion, a more significant difference from *Tabebuia* than any of those mentioned by Seibert (1940a) but still insufficient for generic segregation. In the field *Roseodendron* has exactly the appearance of *Tabebuia* in flowering, fruiting, or vegetative condition and is routinely recognized by collectors as *Tabebuia*. Even the colloquial names for species of *Roseodendron* are generically the same as those of *Tabebuia*, e.g., in Mexico "macuelís de cerro" for *R. millsii* and "macuelís de bajo" for *T. rosea* (Bertol.) DC. (fide Miranda, 1961).

I now consider *Roseodendron* best treated under *Tabebuia*. *Tabebuia millsii* is the only new combination needed.

Tabebuia millsii presents another problem. The species has been supposed to be restricted to the Caribbean side of southern Mexico from Veracruz to Chiapas. However, recent collections from central Bolívar State in Venezuela seem indistinguishable from *T. millsii*. The Venezuelan plant agrees with *T. millsii*, rather than *T. donnell-smithii* of Pacific Mexico to El Salvador, in (mostly) 5-foliolate leaves, entire leaflet margins, dense simple pubescence of leaflet undersides, somewhat flattened reticulately veined as well as longitudinally costate fruit, and dimensions of the mature leaf (leaflets to 17×7 cm and terminal petiolule 3 cm long; the same dimensions for *T. millsii* are 13×6.5 cm and 3 cm, for *T. donnell-smithii* 25×14 cm and 7 cm).

In some respects the Venezuelan population is intermediate between *T. millsii* and *T. donnell-smithii*. Its fruit has 8–12 major ribs (compared to 8 in *T. millsii* and 10–12 in *T. donnell-smithii*). Juvenile leaves of the Venezuelan plant (*Marcano-Berti* 2560 (VEN), *Gentry & Berry* 15060 (MO, VEN)) tend to be 7-foliolate and the leaflets are much larger than mature leaflets and usually somewhat serrate; these juvenile leaves thus approximate the mature leaves of *T. donnell-smithii* (juvenile leaves of *T. millsii* from Mexico are not known). The wood I have seen [*Gentry & Berry* 15071 (MO)] is yellow and thus similar to the clear yellow wood of *T. donnell-smithii* rather than to the heavy tough dark wood described by Miranda (possibly in confusion with *T. chrysantha* or *T. guayacan*?) for *T. millsii* in Mexico. However, lumbermen around La Paragua at the eastern edge of the range of the Venezuelan plant claim that trees from further west have a much darker wood.

Despite its long disjunction, I cannot separate the Venezuelan population from the Mexican one. The only consistent difference between the Venezuelan and Mexican populations of *T. millsii* is in their fruits (based on a single fruiting collection of each). The Venezuelan fruits are only 1.4–2.1 cm wide while those of Mexican *T. millsii* are 2.1–3 cm wide and those of *T. donnell-smithii* are (fide Seibert, 1940a) 2–3 cm wide. The Venezuelan fruits have mostly simple eglandular trichomes while those of *T. millsii* have gland-tipped and dendroid trichomes.

However, the Venezuelan fruits do have occasional branched and gland-tipped trichomes and the difference in capsule width does not warrant a taxonomic distinction. Long range disjunctions are not uncommon in Bignoniaceae (although often collecting artifacts) but in no other case known to me does a disjunction involve such limited areas of distribution at both ends. *Tabebuia donnell-smithii* is introduced in Ecuador and one wonders if a similar introduction might have taken place in Venezuela. However, the Venezuelan tree, known locally as "cacho de venado," is certainly native and is in fact one of the three major timber trees of the La Paragua area (along with "cedro" (*Cedrella*) and "laurel" (*Cordia alliodora*)).

It seems probable that the morphologically somewhat intermediate Venezuelan population represents the ancestral form for both Mexican plants with differentiation of *T. donnell-smithii* in western Mexico and minor changes in *T. millsii* in eastern Mexico occurring subsequent to disruption of a once more continuously distributed ancestral stock.

DISTICTIS & DISTICTELLA

Distictis pulverulenta (Sandw.) A. Gentry, comb. nov.

Distictella pulverulenta Sandw., Brittonia 3: 91. 1938. TYPE: Brazil, Amazonas, Krukoff 8685 (BM, BR, GH, F, K, MO, NY, U).

My recent treatment of *Distictis* (Gentry, 1974d) concluded that several closely related genera (*Phaedranthus*, *Anomoctenium*, *Wunschmannia*) should not be segregated from it. One other genus also needs to be considered in relation to *Distictis*. This is *Distictella*, a segregate which agrees with *Distictis* in large-meshed (alveolate) acolpate pollen, trifid tendrils, phloem 4-armed in stem cross section, a more or less racemose, usually bracteate inflorescence with large tubular flowers, campanulate, truncate cupular calyx, conspicuous disc, and flattened ovoid woody fruit.

Bureau (1864) was the first to propose the separation of *Distictis* (as *Macrodiscus*) from *Distictella* (as *Distictis*). *Distictella* (his *Distictis*) was characterized by the ovary containing a number of series of ovules in each locule and surmounting a cylindrical disc, an oblong, tomentose, flattened capsule with two woody curved valves (one concave, the other convex), the tip of the replum attached to the septum which bears numerous series of linear seed scars along each border, and pubescent seeds. *Distictis* (his *Macrodiscus*) was said to differ from the preceding by the glabrous uncurved capsule with a furrow in place of a rib on each valve, free replum ends extended beyond the tip of the septum, glabrous seeds, and a punctiform hilum; all these characters are those of the fruit. Urban (1916) later pointed out that Bureau had misapplied *Distictis* and that *Macrodiscus* was actually *Distictis* while *Distictis* sensu Bureau must be known as *Distictella*.

Schumann (1894) introduced new characters in separating *Distictis* (as *Macrodiscus*) from *Distictella* (as *Distictis*) on account of its thinner corolla without a conspicuous bend in it. He also noted that *Distictella* differs from *Pithecoctenium* in having terete twigs lacking the detachable ribs of the latter's

TABLE 2. Real and supposed differences between *Distictis* and *Distictella*.

<i>Distictis</i>	<i>Distictella</i>
Capsule glabrous	Capsule pubescent
Capsule not curved	Capsule curved
Capsule midline impressed	Capsule midline raised (implied)
Ends of replum free and extended beyond end of septum	Ends of replum attached to end of septum
Seed scars punctiform	Seed scars linear
Seeds glabrous, with relatively short wings	Seeds pubescent with longer wings
Corolla thinner in texture	Corolla thicker in texture
Corolla straight or slightly curved	Corolla strongly bent
Branchlets 6-angled and ribbed	Branchlets terete, not ribbed

6-angled twigs. Melchior (1927) did not consider *Distictis* in his synopsis of subtribe Pithecocteneae but considered this character of taxonomic importance, separating *Distictella* from *Neves-Armondia* and *Pithecoctenium* on the basis of round rather than 6-angled branchlets. Sprague & Sandwith (1932) further emphasized the character of absence of detachable ribs in *Distictella*. Although considerations of terete versus angled and ribbed branchlets were intended to apply to *Distictella* as compared with *Pithecoctenium*, they are equally valid to separate it from *Distictis*.

The differences that have been proposed to separate *Distictis* (sensu stricto) and *Distictella* are listed in Table 2.

A number of new species have been discovered in both genera since these generic differences were outlined by Bureau (1864) and Schumann (1894) and the fruit differences prove not to be correlated with the floral and vegetative characters. For example *Distictis gnaphalantha* (A. Rich.) Urb. has pubescent fruits but is certainly congeneric with *Distictis lactiflora* (Vahl) DC., the type species of *Distictis*. *Distictella obovata* Sandw. and *D. monophylla* Sandw. have the flowers and twigs of *Distictella* but the fruit of *Distictis* (fruits with scarcely or not at all evident midrib, acuminate, the valves not curved, seeds glabrous). My (Gentry, 1974d) reduction of *Anomoctenium*—which agrees with *Distictis* in uncurved fruit, 6-angled branchlets, and nearly straight corolla—to *Distictis* has expanded that genus to include species with pubescent seeds.

In general the characters of the fruit elucidated by Bureau lack taxonomic significance at the generic level. Seed scars vary considerably in shape even within a single species and the "punctiform" seed scars of *D. lactiflora* are not fundamentally different from the "linear" seed scars of *Distictella*; indeed Bureau's own illustration of *Distictis* (as *Macrodiscus*) showed elongate rather than punctate seed scars. The ends of the replum are extended beyond the end of the septum in species of both genera which have acuminate fruits but not in those species with apically blunt fruits. A tendency to seed pubescence is found in

several species of *Distictis* while some species of *Distictella* have glabrous seeds. The capsule midline may be raised or not and the capsule curved or not in *Distictella*; the capsule is usually pubescent in *Distictis* as well as *Distictella*.

We are left with only vegetative and floral characters separating the two genera. With the exception of a single species these characters appear to be constant and correlated. The flowers of *Distictella* (with one exception) match the syndrome of xylocopid (or *Pithecoctenium*-type) flowers (Gentry, 1974b) in having a thickened corolla which is strongly bent near the middle. With a single exception, these flowers are white, usually with a yellow throat. The flowers of *Distictis* are somewhat thinner in texture and more or less straight. Most are of the "Anemopaegma-type" and are adapted for generalized bee pollination. These species have corollas ranging in color from cream to lavender or magenta. Two species of *Distictis* have the corolla deeper red, more elongate, and stamens exerted or subexserted; these are adapted to hummingbird pollination. All species of *Distictis* have 6-angled branchlets with the angles ribbed; all species of *Distictella* (with one exception) have terete unribbed branchlets. Otherwise there appears to be no vegetative difference.

There are several exceptions to the characters noted above for *Distictella*. Happily enough a single species is responsible for all the exceptions: *Distictella pulverulenta* Sandw. has ribbed 6-sided branchlets, a straight corolla, and flowers described as rich purple. *Distictella pulverulenta* is actually a *Distictis* and the new combination *Distictis pulverulenta* (Sandw.) A. Gentry is necessary. *Distictis pulverulenta* becomes the tenth species of *Distictis* (see Gentry, 1974d).

Should the rest of the species of *Distictella* remain segregated from *Distictis*? The removal of *D. pulverulenta* leaves *Distictella* as a homogeneous and well-circumscribed group. While its nearest relationships are clearly with *Distictis*, it is convenient, at least provisionally, to accept the now traditional separation of *Distictella* while noting that the fruit characters on which this segregation was originally based are of minimal value.

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